THE physical therapy REVIEW

Volume 31 - Number 3 March 1951

Treatment of Cerebrovascular Accident — RANKIN

Hemithorax Measurements — RODHOLM

Hip Rotator Action of the Adductor Longus Muscle — WILLIAMS and WESLEY

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The Physical Therapy Review

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Volume 31 March 1951 Number 3

Treatment of Cerebrovascular Accident

Robert M. Rankin, M.D.

The problem of cerebrovascular accident, along with the other so-called degenerative diseases, is becoming increasingly important. Medicine today is faced with the new phenomenon of an aging population, with a tremendous increase in the disorders produced in the individual by the aging process. A little more than one-quarter of our total population is now over the age of forty-five. In 1980 about half of our population will fall in that age group. There are now an estimated 1,250,000 hemiplegics in this country, and probably an equal number of people having lesser disabilities produced by cerebrovascular accidents, making a total of 2,500,000 people needing treatment for this condition. This is about ten times the number of people suffering from the residuals of poliomyelitis.

Cerebrovascular accident (or "stroke"), as the name implies, is a lesion occurring in the vascular system of the brain. There are three major mechanisms by which the lesion is produced: (1) cerebral thrombosis, which is the occlusion of a cerebral artery by degenerative changes in the intima or lining of the vessel, chiefly due to deposition of cholesterol, (2) cerebral hemorrhage, which is the rupture of a cerebral artery caused by degenerative changes in the media, or muscular layer of the vessel, (3) cerebral embolism, which is the occlusion of a cerebral vessel by a mass formed elsewhere in the body and carried to the brain by the blood flow. Most cerebral emboli arise from the heart.

Regardless of the mechanism of the vascular accident, the result is the same in that a given area of brain tissue is rendered anoxic, deprived of its oxygen supply. The brain possesses a tremendous demand for oxygen and per gram of tissue is second only to the thyroid in oxygen consumption. For this reason, it is extremely dependent on its oxygen supply. The cerebral neurones are permanently destroyed by fifteen seconds of complete oxygen deprivation. Consequently, in any cerebrovascular accident a certain amount of brain tissue is irreparably destroyed. Surrounding the destroyed area is a much larger zone in which secondary changes are produced. In the surrounding zone there are vasospasm, vascular stasis, edema, venous thrombi, and extravasation of blood cells into the tissue. These changes are most marked adjacent to the center of the lesion and decrease progressively toward the periphery. This produces a state of hypoxia, or partial oxygen deprivation. Hypoxia, continued long enough, destroys brain cells, and so we see the cells in the center of the injured zone, and adjacent to the completely destroyed area, gradually dying out, thus producing a progressive enlargement of the totally destroyed area. Concomitantly, the periphery of the injured zone continues to reach out with an ever-increasing radius, until physiologic processes occur which halt the spread of the lesion. This may occur early, in which case the lesion involves a small area, or it may continue until an entire cerebral hemisphere is completely involved.

There is nothing we can do to restore the brain tissue that is completely destroyed by the insult of the initial vascular accident. Brain tissue, once

Clinical Instructor in Neurology, University of Washington School of Medicine, Seattle, Wash.

destroyed, does not regenerate. However, with our present knowledge of the dynamics of the cerebral circulation, there is much we can do to restore the brain tissue that is functionally damaged, to revert the pathologic changes that occur in the injured zone, and thus prevent the extension of the lesion. By proper treatment we are able to reduce significantly the residual disability of the patient.

Therapy of cerebrovascular accident divides itself into two equally important phases: (1) treatment of the acute phase, and (2) rehabilitation.

Treatment in the acute phase of a cerebrovascular accident should be directed primarily toward restoring the normal physiology of the damaged zone of brain tissue surrounding the totally destroyed tissue. The pathologic changes in this area are primarily due to insufficient blood supply and edema, and so treatment is primarily to improve the blood supply and to reduce the edema. Many of the patients are unconscious when treatment is begun, thus adding additional complications. The initial vascular insult is frequently accompanied by generalized shock, or circulatory collapse. This must be treated vigorously, for if it becomes irreversible, the patient dies. Also the collapse of the general circulation further impairs the circulation in the damaged brain, and slows recovery. Any circulatory collapse, however minor, is treated with parenteral blood, plasma or fluid, as the occasion demands. Frequently cardiac supportive therapy is necessary to maintain normal cardiac output and prevent slowing of venous return from the brain.

The respiratory system frequently needs special attention. In the unconscious patient the swallowing, gag, and cough reflexes are impaired or absent. This permits saliva, respiratory tract secretions, and vomitus to occlude the respiratory tree, causing impaired oxygenation of the blood (and therefore of the damaged brain). This difficulty is frequently sufficient to produce death due to asphyxia or aspiration pneumonia. The anatomy of the tracheobronchial tree dictates the obvious treatment for the condition. When a patient lays flat on his back, the path from the posterior nasopharynx is downward, so that secretions easily drain into the lungs. This anatomic fact is put to use by turning the patient almost over on his abdomen so that drainage occurs from the lower bronchial tree out toward the mouth. A small pillow placed under the shoulder and hip on one side does not impair this procedure and facilitates nursing care. In addition to this postural drainage, suction with a soft catheter and a suction machine is usually helpful. Even if an adequate airway can be maintained, it is usually wise to place the patient in an oxygen tent to guarantee adequate respiratory exchange.

Treatment of the cerebral edema demands early attention. The best method of accomplishing this is to elevate the patient's head and chest. Because of the accumulation of secretions in the respiratory tree this must sometimes be delayed for twenty-four to forty-eight hours, but the elevated position is instituted as soon as possible. Its use is just as efficacious and logical as the elevation of an edematous injured extremity. Cerebral edema is also controlled by the use of intravenous hypertonic solutions. Such solutions pull fluid from the edematous brain and excrete it via the kidneys. In the opinion of the author, 50 percent sucrose is the most efficacious hypertonic agent. Since hypertonic solutions can cause chemical nephritis, their use must be discontinued after four or five days. When fluid balance must be maintained by the intravenous route one must be judicious in administration of fluid. Too much fluid increases the cerebral edema; too little fluid interferes with body function. A rule of thumb is to give the patient 1500 cc. of fluid per day, with an additional 500 cc. for each degree Fahrenheit of fever. Since edema fluid is held in the tissues primarily by the sodium ion, saline should be given sparingly. Ten percent glucose in water is the best solution for this purpose.

Specific treatment to improve the cerebral circulation is carried on concomitantly with the above therapy. In the author's opinion nicotinic acid is an effective agent in increasing the cerebral circulation in these patients. This is given intramuscularly at first, and by mouth as soon as the patient can swallow adequately. It should be continued at least until maximum recovery occurs. There is some evidence that blocking the sympathetic nerve pathways to the brain improves the cerebral circulation, and one or more cervical sympathetic blocks are usually done.

Adequate nutrition is important to maintain the blood plasma protein level and to aid regeneration of the damaged brain tissue. Oral feedings are begun at the earliest possible moment. In order to prevent invasion of the respiratory tree by fluids placed in the mouth, it is a good rule to give nothing by mouth unless the patient is able to suck fluids against gravity through the standard glass drinking straw. By the time he is able to do this he is also able to swallow properly. Any patient who is not able to take nourishment by mouth for forty-eight hours must be fed by gavage with the standard tube-feeding formula. Usually the stomach tube is left in place until the patient can resume oral feeding. Depletion of body vitamin stores occurs very rapidly and additional vitamins must be supplied. Since gastrointestinal vitamin absorption is impaired in the elderly even in health, the par-

enteral route is relied upon in treatment of this condition. Crude liver-extract, plus water-soluble Vitamin A and D, are given intramuscularly each day until the patient has an adequate oral intake, and less frequently for a prolonged period thereafter.

REHABILITATION

All of the above therapy is directed toward preserving the patient's life and to limiting the amount of brain tissue that is ultimately destroyed. As noted previously, however, there is always some brain tissue that is permanently killed, usually leaving the patient with a paralysis of variable severity. The rehabilitation program is designed to reduce the disability produced by the paralysis. Persistent, adequate, and intelligent physical therapy can do much to achieve this end. Unfortunately, this phase of therapy in cerebrovascular accidents is either completely neglected, or so superficially performed that each year thousands of people who could otherwise be self-sustaining economic units are thrown into relief agencies or onto the support of their families. The expense of a good physical therapy program is infinitesimal compared with the tremendous economic burden imposed on society by our failure to carry out adequate treatment.

There are several fundamental objectives on which the physical therapy program should be based: (1.) Secondary changes in the involved extremities should be prevented; (2.) The residual function of the extremity should be developed to its maximum efficiency; (3.) The development of substitutive or secondary neural pathways should be facilitated; (4.) Only when the involved extremity has been developed to its fullest should an attempt be made to "train around" the disability by education of the uninjured parts.

The single, most important factor in the entire rehabilitation program is that treatment must be started at the earliest possible moment. It should be begun as soon as the patient's condition stabilizes, preferably in the first day or two following the stroke. It should be the responsibility of the physical therapist to advise the physician on all treatment directly related to ultimate restoration of the involved extremity.

In any paralyzed extremity, changes set in immediately that damage the limb beyond the effect produced by the cerebral lesion. The venous return, and therefore the blood flow through an extremity, is dependent on the milking of the veins brought about by normal muscle tone and activity. When the muscles are paralyzed, venous stasis occurs. The limb frequently becomes frankly edematous; but, even in the absence of edema, circulatory changes occur that ultimately lead to fibrosis of the muscles and contractures and fixation of the joints. Also, due either to the circulatory changes or poorly understood changes in the neural pathways, the limb frequently becomes painful. To prevent these changes the limb is elevated. The joints are moved actively or passively through their full range of motion. Adequate, frequent massage is extremely important to aid the circulation, to maintain the muscle tone, and to maintain a flow of sensory impulses that does much to prevent the development of a painful extremity. The vital necessity of this early massage is frequently not realized. Heat in any form should not be used in the early treatment of the paralyzed limb.

Few of us realize how rapidly a permanent stretch paralysis occurs in a paretic extremity. It is the physical therapist's duty to be on guard constantly against foot drop, thigh rotation, etc., and to take measures to prevent them. The added insult of a stretch paralysis is often the difference between a usable and a useless extremity.

The patient is encouraged to be ambulatory as rapidly as possible. The deleterious effect of prolonged bed rest, particularly in elderly people, has been amply demonstrated. A standard orthopedic walker with a seat is ideal for the early stage of ambulation. The standard physical therapy technics of hydrotherapy, heat, massage, galvanic stimulation, muscle reeducation, and muscle strengthening are used as dictated by the individual condition.

Anyone who has treated patients for cerebrovascular accident realizes that the disability of the patient at the termination of the acute phase is by no means permanent. We know that secondary muscles can be trained to take over the function of a severely injured muscle. We know that marginally damaged brain tissue can improve progressively in function over a period of months or years. More important is the fact that the normal brain tissue can be trained to take over many of the functions of the damaged tissue. Almost every motor function has, in addition to its motor point on the cerebral cortex, a number of secondary motor points. Through training, the secondary pathways can be made to replace the destroyed pathways. It has been shown that most motor functions are represented, not only in the contralateral hemisphere, but in the ipsilateral hemisphere as well. It has been shown that motor function can be transferred from a damaged cerebral hemisphere to the intact cerebrum on the opposite side (the same side as the hemiplegia).

The key to the development of these secondary neural pathways is repetition. Even though the

patient can not perform the desired action, persistent attempts to perform the motion, over and over again, hundreds of times daily, can ultimately result in the motion being performed. Electrical stimulation of the muscle to show the patient what is desired, followed immediately by repeated attempts at voluntary motion, does much to facilitate this procedure. Once the voluntary motion is obtained, it is possible to develop the strength necessary to make the motion useful. It is believed that Prostigmin and Tolserol facilitate the transmission of impulses across the synapses in the secondary neural pathways, and thus aid the development of those pathways. At best, medication is helpful, only, and the bulwark of rehabilitation is continuous repetition.

The rehabilitation program is a slow, tedious, trying procedure. Its whole success depends on the energy put forth by the patient. He must have the burning, insurmountable will to overcome his disability. Without this everything else is wasted motion. The zeal and energy of the physical therapist are extremely important in this regard. In addition to supervising the mechanical processes of rehabilitation, he must keep the patient fired constantly to the highest pitch of enthusiasm and effort. Group therapy is an extremely valuable method of achieving this end. Every patient has the firmly ingrained belief that the paralysis from a stroke is permanent. This belief must be eradicated. Once he can see he is making progress, or once he can see others making progress, his unflagging effort is more easily attained.

This whole therapeutic regimen will probably cure few patients. It will, however, substantially reduce the disability of most patients. People otherwise bed-ridden will be able to take care of their personal needs; many with lesser disabilities will be restored as productive economic units; some will be returned to complete health and normal function. The social and economic dividends from a properly constructed program are tremendous.

Meet Our New Contributors

Sidney M. Dawe, senior physical therapist, Kern General Hospital, Bakersfield, California. Mr. Dawe received his physical therapy training at Bakersfield College and California Hospital. He has held his present position since 1942. Mr. Dawe is a member of the American Physical Therapy Association and the American Registry of Physical Therapists.

Robert M. Rankin, M.D., 1317 Marion Street, Seattle 4, Washington. Dr. Rankin is Clinical Instructor in Neurology at the University of Washington School of Medicine. He was graduated from the University of Washington and Johns Hopkins Medical School, and served his internship at Johns Hopkins. Dr. Rankin was Assistant Resident at Barnes Hospital in St. Louis before accepting his present position.

Miriam Rodholm, Assistant Chief, Physical Therapy Section, Veterans Administration Hospital, Hines, Illinois. Miss Rodholm attended Grand View College in Des Moines, Iowa, and was graduated from Drake University, in Des Moines. She received her physical therapy training at Walter Reed General Hospital, and was Head Physical Therapist at the 250th Station Hospital in the European theatre of operations for two years. Miss Rodholm has also served as a physical therapist at the Detroit Curative Workshop. She has held her present position since 1946. Miss Rodholm is a member of the American Physical Therapy Association and the American Registry of Physical Therapists.

Wallace Wesley, Le Roy, Illinois. Miss Wesley's most recent position was on the faculty of the Northern Illinois State Teachers College, teaching kinesiology and body mechanics. She attended Illinois State Normal School, received an M.S. in Health and Physical Education from the University of Oregon, and took her physical therapy training at Fitzsimons General Hospital. Miss Wesley served in the Army for three years as a physical therapist. During the past year she did graduate work at Stanford University, and is a doctoral candidate. Miss Wesley is an inactive member of the American Physical Therapy Association. She is also affiliated with the National Education Association, the American Association of University Women, the Association of College Professors, the Illinois Health and Physical Education Association, and the American Association for Health, Physical Education, and Recreation.

Hemithorax Measurements

Miriam Rodholm

Introduction

In the treatment of chest patients when surgery is indicated, a number of problems present themselves to the physical therapist:

(1) Prevention of loss of motion in the shoulder on the side of surgery

(2) Restitution of muscle strength in muscles of the shoulder girdle and in the upper extremity on the affected side

(3) Maintenance of correct body alignment and correction of deformities which may follow thoracic surgery

(4) Establishment of adequate chest expansion, and prevention of an immobile chest wall

Preoperatively, the patient on whom thoracic surgery is contemplated is seen by the physical therapist in order to evaluate his condition and to explain his postoperative physical therapy. Posture evaluation is accomplished; range of motion in the shoulder on the surgical side is measured; a superficial check of the muscle strength of both upper extremities and trunk muscles is made; and hemithorax measurements are taken. Without a preoperative evaluation, conditions existing prior to surgery may not be recognized. This initial evaluation of the thoracic surgery patient is also important as a guide in the planning of his postoperative physical therapy. In addition to this preoperative evaluation of the patient, posture exercises, and exercises for the upper extremities which will be done postoperatively, are taught. If reexpansion of the lung or a portion of the lung is indicated, it is necessary that segmental breathing exercises be instituted preoperatively.

Adequate means for checking posture, range of motion, and muscle strength are well known to all physical therapists. Until recently, however, there has been no method of measuring chest expansion accurately. Measurement of chest expansion is an element in establishing diagnosis, is important in measuring the treatment progress of a patient, and also contributes to the initial evaluation of the thoracic surgery patient.

In early attempts to measure chest expansion, a common tapeline was used. The usual method was to encircle the thorax with the tapelines and take a reading anteriorly of total chest expansion. Recognizing that in cases where expansion of one portion of the chest is impaired the total measurement method would not indicate the amount of impairment of one segment, this method of measurement was deemed inadequate.

The next method of measurement used again utilized the common tapeline, held in place on the spinous process of a dorsal vertebra manually, or by means of an adherent material. Measurements were taken first of one side of the thorax, then the other. This proved impractical when it was noted that a patient might shift the entire body to the side being measured and render the results inaccurate. The tension with which the tape was held also influenced the results of measurement. Separate and simultaneous measurements of the thorax were felt necessary, since the difference in the expansion of the two sides could only be demonstrated in this way, and because of the difficulty of exhaling and inhaling the same amount at different times.

An improved device for measuring the movements of both sides of the chest simultaneously was developed by Newman.

In January 1948 the Newman Expansometer was put in use in the Thoracic Surgery Section of the Veterans Administration Hospital, Hines, Illinois. Since that time all patients for whom segmental breathing exercise is part of physical therapy are measured preoperatively, and frequent postoperative measurements are taken also.

In addition, the need for an accurate method of measuring upper segments of the thorax was recognized. Adaptations of the standard pelvimeter were therefore made to serve this purpose. One-inch diameter plastic disks on swivel joints were attached to both arms of the pelvimeter so that the points would not dig into tissues and cause pain or discrepancies in measurement. A spring providing uniform tension on both arms

Assistant Chief, Physical Therapy Section, Physical Medicine Rehabilitation Service, Veterans Administration Hospital, Hines, Ill.

Published with the approval of the Chief Medical Director, Veterans Administration. The statements and conclusions published by the author are the result of her own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

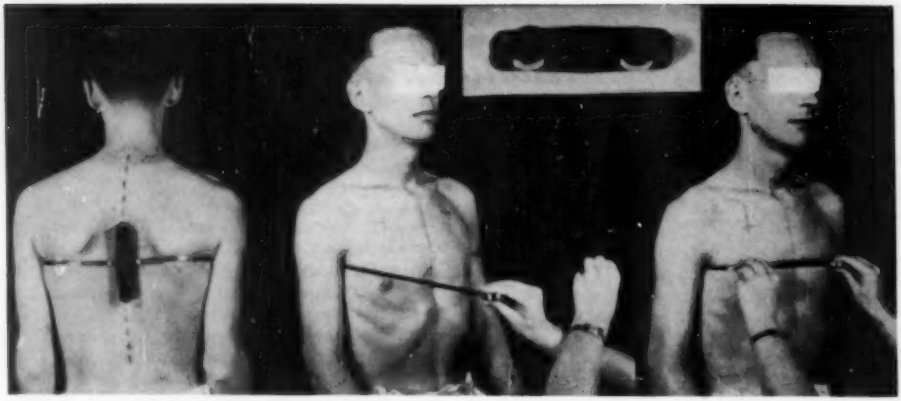

Figure 1. Hemithorax Measurement with Posterior Placement of the Expansometer.

was placed near the pivot of the pelvimeter. This specially adapted pelvimeter is referred to as a "chest caliper."

Hemithorax measurements are taken with the Expansometer and chest caliper in all cases in which one desires to measure chest expansion, in the normal as well as in pathological conditions—e.g., poliomyelitis, multiple sclerosis, quadriplegia, arthritis, and thoracic surgical conditions. Regardless of the patient's disability, all measurements of chest movements are taken with the Expansometer, even though there may be no impairment in respiratory movements.

METHOD OF HEMITHORAX MEASUREMENTS

In measuring both halves of the lower segments of the thorax simultaneously, either of two methods may be used. In the first, the Expansometer is placed posteriorly; the second method utilizes anterior placement of the Expansometer. The preference in using either placement technic is left to the discretion of the physical therapist.

Upper segments of the thorax are measured with the chest caliper.

I. Hemithorax Measurement of the Lower Segments of the Thorax with *Posterior Placement* of the Expansometer *(See Figure 1.)*
   - A. The midsternal line is marked with a skin pencil.
   - B. A mark is made on the mid-clavicular line, two inches below the lower border of the clavicle, both left and right.
   - C. The spinous processes of the seventh cervical vertebra and the first ten thoracic vertebrae are marked.
   - D. Lower chest measurements are taken simultaneously at the level of the tenth thoracic spine. (Other levels for measurement may be used.)
   - E. The Expansometer is placed over the previously marked tenth thoracic spine.
   - F. The physical therapist crosses the tapes at the midsternal line where the readings are taken. His right hand holds the tape measuring the right hemithorax, his left hand the tape measuring the left hemithorax.
   - G. The patient is instructed to inhale deeply, then exhale fully. Expiration measurement is taken first.
   - H. Inspiration is measured after the patient has inhaled and exhaled several times so that he may reach maximum expansion.
   - I. The measurement may be recorded in inches or centimeters. VA Form 10-2305 Chest and Shoulder Examination—Physical Therapy may be used for this purpose.

II. Hemithorax Measurement of the Lower Segments of the thorax with Anterior Placement of the Expansometer *(See Figure 2.)*
   - A. Skin marking procedure is the same as that outlined in A, B, and C of hemithorax measurement with posterior placement of the Expansometer.
   - B. In the anterior placement the lower pointed end of the Expansometer coincides with the infrasternal notch.

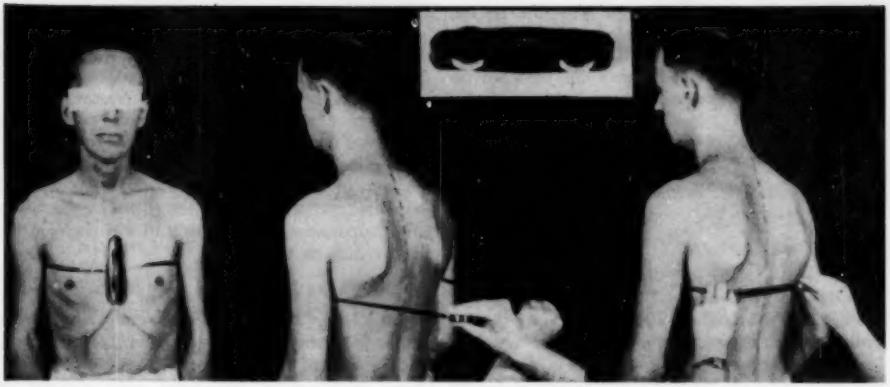

Figure 2. Hemithorax Measurement with Anterior Placement of the Expansometer.

C. The physical therapist crosses the tapes at the level of the tenth thoracic vertebra, where the readings are taken. (Other levels for measurement may be used.) His right hand holds the tape measuring the right hemithorax, his left hand the tape measuring the left hemithorax.
D. The patient is instructed to inhale deeply, then exhale fully. Expiration measurement is taken first.
E. Inspiration is measured after the patient has inhaled and exhaled several times so that he may reach maximum expansion.
F. The measurements may be recorded in inches or centimeters.

III. Hemithorax Measurement of the Upper Segments of the Thorax with the Chest Caliper *(See Figure 3.)*

A. Skin marking procedure is the same as that outlined in A, B, and C of hemithorax measurement of the lower segments of the thorax with posterior placement of the Expansometer.
B. With the chest caliper, the distance between the skin mark two inches below the mid-clavicular line anteriorly, and the spinous process of the second thoracic vertebra posteriorly, is measured. One arm of the caliper is placed on each of these previously marked areas. (Other levels for measurement may be used.)
C. The patient is instructed to inhale deeply, then exhale fully. Expiration measurements are taken first.

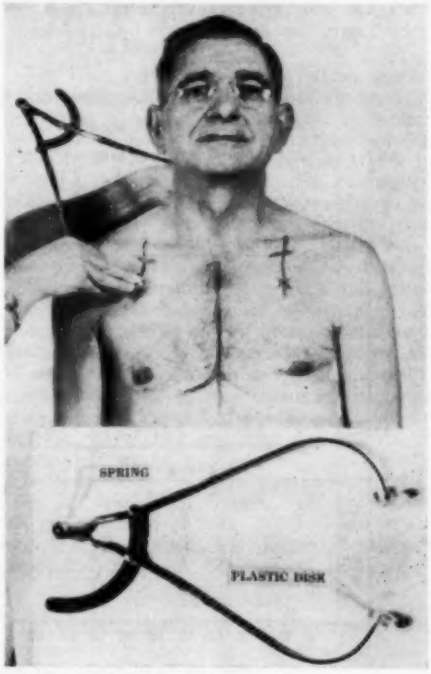

Figure 3. Hemithorax Measurement with the Chest Caliper.

D. Inspiration is measured after the patient has inhaled and exhaled several times so that he may reach full expansion.
E. The measurements may be recorded in inches or centimeters.

REPORT OF CASES

The following case reports illustrate the value of hemithorax measurements as a guide in the patient's progress.

Case 1. (See Chart 1.)

Mr. V.A., a 31-year-old white veteran, was admitted on November 22, 1948. An exploratory thoracotomy performed February 16, 1949, revealed the presence of a tuberculoma in the right lower lobe and a wedge resection was done. The patient's Physical Medicine Rehabilitation began February 15, 1949, with preoperative orientation and evaluation. Hemithorax measurements on this date showed a 1-inch expansion in the upper left chest, and a ¾-inch expansion in the upper right chest. Lower chest expansion was 1 inch bilaterally. Treatment was resumed the day following surgery with range of motion in both shoulders, posture training, and segmental breathing exercises. The patient was discharged March 10, 1949, after approximately three weeks of treatment. Predischarge examination revealed that posture had improved over preoperative level, range of motion in the right shoulder was normal, and chest expansion of both upper segments of the chest had remained at preoperative level, while the lower chest expansion had increased to 1¼ inch on the left, 1 inch on the right.

Case 2. (See Chart 2.)

Mr. L.E., a 30-year-old Negro veteran, was admitted to the hospital November 22, 1948, with a diagnosis of lung abscess, chronic right upper lobe. Right upper lobectomy and removal of dorsal segment of right lower lobe was performed December 15, 1948. Physical therapy was begun December 14, 1948, with preoperative evaluation. Hemithorax measurements taken on that date revealed expansion to be ½ inch in all quadrants

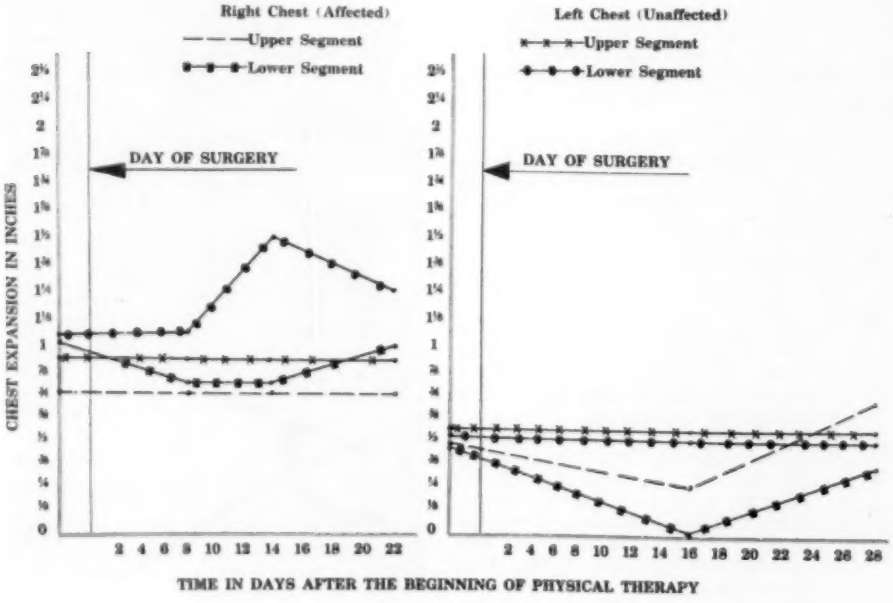
Right Chest (Affected)
Upper Segment
Lower Segment
DAY OF SURGERY
CHEST EXPANSION IN INCHES
2 4 6 8 10 12 14 16 18 20 22
Left Chest (Unaffected)
Upper Segment
Lower Segment
DAY OF SURGERY
2 4 6 8 10 12 14 16 18 20 22 24 26 28
TIME IN DAYS AFTER THE BEGINNING OF PHYSICAL THERAPY

Chart 1. Comparison of Hemithorax Measurements of a Patient Following Exploratory Thoracotomy, Right.

Chart 2. Comparison of Hemithorax Measurements of a Patient Following Lobectomy, Right Upper Lobe.

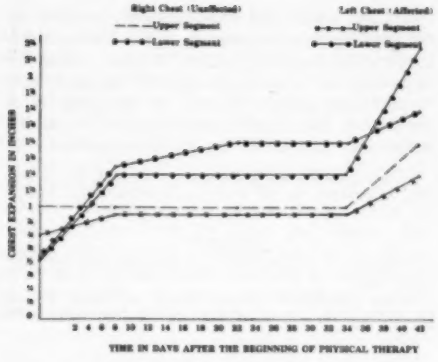

Chart 3.
Comparison of Hemithorax Measurements of a Patient Demonstrating Spontaneous Pneumothorax, Left.

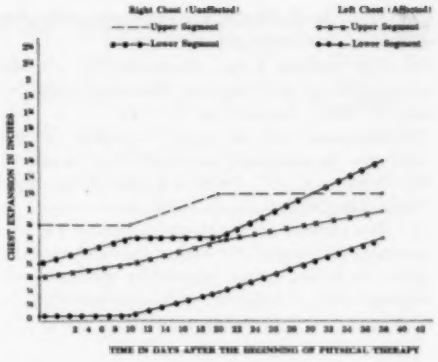

Chart 4.
Comparison of Hemithorax Measurements of a Patient Demonstrating Loculated Hemopneumothorax, Left.

of the chest. Treatment was resumed the day following surgery, with segmental breathing exercises, range of motion in the right shoulder, and posture training. Predischarge evaluation accomplished January 11, 1949, revealed bilaterally complete range of motion in the shoulders. Posture had returned to the preoperative level. Chest expansion was improved—½ inch, left lower chest; ⅜ inch, right lower chest; ½ inch, left upper chest; ¾ inch, right upper chest. The patient was discharged January 11, 1949, after approximately four weeks of treatment.

Case 3. (See Chart 3.)

Mr. E.E., a 24-year-old white veteran, was admitted with a diagnosis of spontaneous pneumothorax November 25, 1948. Treatment while on the Thoracic Surgery Section included repeated aspirations of blood and air. No surgical treatment was necessary. Physical therapy was begun December 20, 1948, with a prescription for segmental breathing exercises, posture training, and range of motion in the left shoulder. Hemithorax measurements at that time disclosed expansion of ½ inch bilaterally in the lower segments of the chest, while upper chest expansion was ¾ inch left, 1 inch right. The patient exhibited a slight functional scoliosis, but was aware of the deviations in posture and worked hard at maintaining correction. The patient was discharged February 2, 1949, after approximately six weeks of treatment, with marked improvement in chest expansion and full correction of postural deviations. Final hemithorax measurements were 1¼ inch expansion, upper left chest; 1½ inch expansion, upper right chest; 2½ inch expansion, lower left chest; 1¾ inch expansion, lower right chest.

Case 4. (See Chart 4.)

Mr. F.K., a 31-year-old white veteran, was admitted January 22, 1948, with a diagnosis of hypertension. The patient underwent a thoracic lumbodorsal sympathectomy on the right on February 4, 1948, and on the left on March 15, 1948. A left, postoperative, residual empyema pocket necessitated the patient's transfer to the Thoracic Surgery Section on April 5, 1948. Physical therapy was begun April 12, 1948, with a prescription for range of motion in both shoulders, and segmental breathing exercises. Initial evaluation showed incomplete range of motion in both shoulders, weak and shallow breathing bilaterally. Hemithorax measurement revealed complete loss of expansion, left lower chest; ½ inch expansion, right lower chest; ⅜ inch expansion, left upper chest; ⅞ inch expansion, right upper chest. On May 19, 1948, chest expansion was found to be markedly improved, both left and right—¾ inch, left lower chest; 1⅜ inch, right lower chest; 1 inch, left upper chest; 1 inch, right upper chest. Range of motion in both shoulders was almost complete. The patient was discharged after approximately five weeks of treatment.

SUMMARY

(1) Accurate measurement of chest expansion is necessary to:

a. Aid in establishing diagnosis.
b. Evaluate initial condition of the chest surgery patient.
c. Measure treatment progress of the patient.

(2) Methods of chest measurement that only give total chest expansion are unreliable.

(3) The Newman Expansometer provides a means of accurate and simultaneous hemithorax measurement of lower segments of the chest.

(4) Expansion of the upper segments of the chest may be adequately measured by the use of the "chest caliper" (standard pelvimeter with special adaptations).

(5) The method of measurement presently in use arbitrarily establishes the second and tenth thoracic spines as anchor points; expiratory measurements are taken first in order that full expansion may be reached.

(6) Case studies of chest surgery patients on the physical therapy program at the Veterans Administration Hospital, Hines, Illinois, reveal the importance of accurate hemithorax measurements in providing accurate data as to the progress of the patient who is receiving segmental breathing instruction, and the efficacy of his treatment.

(The author is greatly indebted to the Medical Illustration Laboratory, at the Veterans Administration Hospital, Hines, Illinois, for the photographs.)

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Hip Rotator Action of the Adductor Longus Muscle

Marian Williams, M.A., and Wallace Wesley, M.S.

The study of muscle function through the years has resulted in wide variation in the descriptions of the activity of certain muscles. While a survey of texts and other publications on this subject indicates considerable agreement, in some cases muscle function is poorly defined and there is marked disagreement. An excellent example is the hip rotator action of the thigh adductor group.

Review of a number of authoritative sources showed that external rotation is mentioned in many instances and internal rotation in others, the former more frequently. Gray's *Anatomy of the Human Body* gave external hip rotation for the adductor group in the twenty-fourth edition (1942), and internal rotation in the more recent edition (1948). Such a situation presents a dilemma to the student of kinesiology. McGregor suggests the difficulty of such problems by repeating Cunningham's description of the psoas major: a medial femoral rotator until the axis of rotation becomes medial to the long axis of the psoas, when it becomes a lateral rotator. He adds, "Professor Wright used to repeat this twice, and, seeing the look of misery on his students' faces, say, 'Well, if you don't understand it, just tell the examiner what I have told you.'"

In an attempt to resolve this problem it was proposed to employ the electromyograph. Tests were limited to the adductor longus muscle as it may be reached easily for the application of surface electrodes. Accordingly, a brief review of rotator action described in the literature will be limited to reports on this particular muscle of the adductor group when such are available.

Assistant Professor, Division of Physical Therapy, Stanford University, Stanford, Calif.

Doctoral Candidate, Stanford University, Stanford, Calif.

External rotation of the hip was listed specifically as an action of the adductor longus by nine texts of the total number of eighteen consulted. *(See numbers 3, 5, 6, 7, 10, 11, 13, 15, and 16 in bibliography.)* Two additional sources omit rotation of the adductor longus but state that external hip rotation is a function of the upper adductor magnus, or of the whole adductor group with the exception of the lower portion of the adductor magnus.

The anatomy texts of Gray and Morris list internal rotation without qualification as an action performed by the adductor longus. Two texts fail to mention rotation. The remaining three throw this light on the subject:

Steindler: No mention is made of rotation under the adductor longus; however, weak inward rotation is attributed to the pectineus and weak outward rotation to the adductor brevis.

Wright: ". . . . when I asked a patient to rotate his thighs inward the adductors contracted strongly" (p. xi, preface). "[The adductors brevis and longus] Do not work for attempted outward rotation, although their rotator action is unquestionable. They do work for adduction, even if combined with inward rotation." (p. 170)

Grant: The adductor longus is listed with the lateral rotators, although with the foot on the ground the "upper adductor mass" is given with the medial rotators. (p. 430)

APPARATUS AND PROCEDURE

The equipment used for recording muscle action potential in this study consisted of an amplifier and a recording oscillograph. The response of the system to various frequency components of the input is uniform from 150 cycles per second to 500 cycles per second, with gradual attenuation above and below this range. A rejection filter is used in the amplifier to eliminate 60-cycle interference picked up from the power lines by the input leads. The effective resistance which appears across the amplifier input terminals is a low value of the order of 500 ohms. This means that the magnitude of the input voltage obtained will depend upon the skin resistance of the subject. The signal voltages quoted in the records will, therefore, be somewhat lower than those obtained under similar conditions with an amplifier having a high input resistance. The paper speed of the oscillograph is 9 inches per second.

Copper electrodes ¾ of an inch in diameter were used. The outer layer of dry skin was removed by light sandpapering and electrode paste was applied. The edge-to-edge distance between electrodes was approximately 1¼ inches.

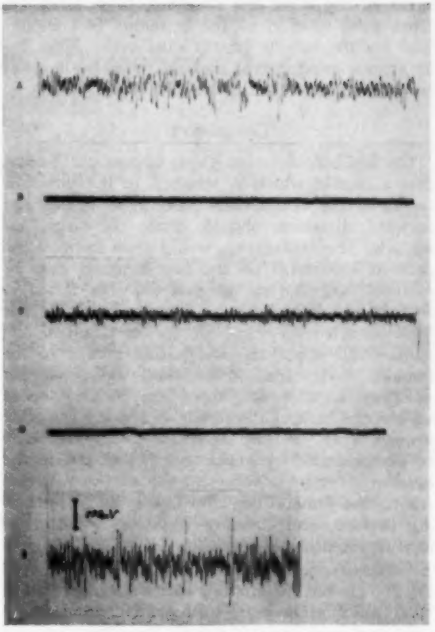

Figure 1. Illustration of electrical potentials from the adductor longus muscle. A. Activity in internal rotation of thigh, B. Absence of potential with external rotation (sitting test position), C. and D. Records of internal and external rotation (back-lying), E. Potential accompanying hip adduction.

Ten subjects were included in the study. Tests were made of external and internal hip rotation near the end of the range with the subject sitting, back-lying with the knee flexed over the table edge, and standing. Subjects were cautioned to avoid any tendency to lift the thigh from the table in the sitting and back-lying test positions. No external resistance was given to the movement. In the standing position the supporting foot was elevated on a block so that the extremity to be tested was free to rotate in a normal position.

RESULTS

Although in a few instances slight evidence of activity in the adductor longus appeared in external rotation, the potential was invariably much greater in internal rotation and consistently accompanied this motion. Figure 1 shows an absence of activity during external rotation. In the standing test, relatively less potential was obtained than in

either of the other test positions, presumably because axial rotation of the extremity is a lighter load for the rotator groups than moving the leg up against gravity, as is the case when the lever is bent at the knee (sitting and back-lying tests).

DISCUSSION

On first consideration it may appear paradoxical that a muscle which is attached to the posterior aspect of the femur, and pulls in a medial and forward direction, should rotate the thigh internally. The explanation would seem to lie in the peculiar mechanics of the hip joint. It may be recalled that, due to the fact that the femur is sharply angulated near the proximal end and the head is relatively fixed in the acetabulum, the bone pivots about an axis passing medial to the femoral shaft, and, in rotation, the trochanter describes a wide arc about the axis. Pressure against the back of the femur will swing the bone inward when the two ends are fixed. This may be demonstrated by grasping a pin placed in the head of a femur to represent the axis of rotation, resting the femoral condyles lightly on a supporting surface, and exerting force by a string or tape representing the adductor longus pull.

Grant describes this principle as follows: "When the foot is on the ground, rotation of the femur takes place around an axis passing through its head and intercondylar notch. This being so, any rotatory power the Ilio-psoas, Pectineus and Adductor Longus may possess is one of medial rotation because they are inserted lateral to the axis." In the present study the adductor longus appeared to act in internal rotation regardless of the fact that the foot was not fixed. Whether it acts as a "prime mover" or synergistically with other muscles to stabilize and guide the motion may be open to question. At any rate this muscle has been observed to take part in the pattern of internal rotation, rather than external, as is commonly claimed.

Although the rotatory action demonstrated by the adductor longus cannot be interpreted to indicate definitely the action of the other adductors, it may be reasonable to expect that other muscles having a similar line of pull may have similar rotatory function. This provides an interesting subject for further investigation.

SUMMARY

1. A review of eighteen texts relating to muscle function revealed the following with regard to hip rotatory action of the adductor longus muscle:

a) Eleven listed external rotation of the hip for the adductor longus or adductor group.

b) Two specified internal rotation of the hip without qualification.

c) The remaining number did not mention rotation of this muscle, were indefinite, or qualified the statements made.

2. Electromyograph studies on ten subjects indicated in each instance that the adductor longus muscle was active during internal rotation of the hip. Little or no potential was recorded with external rotation. These results were obtained consistently with the subjects in the sitting and back-lying test positions (with the hip flexed and extended). Smaller potentials were obtained in the standing position as in the other two tests.

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Physical Therapy in a Tuberculosis Hospital

Wilma-Nell Harmony

Too frequently one hears the comment from physical therapists ready to enter practice, yes, and from therapists already established in the field, "I don't and/or wouldn't want to work in a tuberculosis hospital because most physical therapy is contraindicated to tuberculous patients, and I want to use the technics that I have learned!" First, let me assure you that I am in total disagreement with this apparently universal opinion that physical therapy in a tuberculosis hospital is "limited." Then let me present the facts, as I have learned them, for *you* to be the judge of the veracity of this quotation.

Tuberculosis is caused by a germ—the tubercle bacillus. A person who gets tuberculosis gets it from somebody else who has it, and TB, as it is commonly termed, has no respect for age, sex, personality, income, race, nor creed. When the germ enters the body, its usual portal of entry is believed to be via the bronchial tree into the lungs, although the disease is sometimes found in the intestines, kidneys, glands, bones, joints, etc.

Until that hoped for anti-TB drug is discovered, conquering the disease in the individual is a prolonged, monotonous, full-time job. The patient under treatment is put to bed and instructed to rest body and mind completely. It is at this juncture that the physical therapist becomes a part of the working team in a tuberculosis hospital. The entire relationship of the physical therapist to the tuberculous patient is as important as the complete mastery of technics, and the person entering this field of physical therapy must give more than just the skill of her hands. REST!! the doctor orders, and prescribes relaxation exercises to make rest more profitable. As the patient improves under the skillful handling of doctor, nurse, dietitian, et al., graduated bed exercises preparatory to ambulation become a part of his daily routine.

Chief, Physical Therapy, Veterans Hospital, Livermore, Calif.

Reviewed in the Veterans Administration and published with the approval of the Chief Medical Director. The statements and conclusions published by the author are the result of her own study and do not necessarily reflect the opinion or policy of the Veterans Administration.

However, certain types of tuberculosis, especially those with cavitation, may not respond readily to bed rest alone. It then becomes necessary to give additional rest and relaxation to the lung by some form of "collapse therapy." The thoracic surgical procedures employed include phrenic nerve paralysis, pneumothorax, pneumonolysis, pneumoperitoneum, thoracoplasty, lobectomy, pneumonectomy, extrapleural pneumothorax, and cavity drainage. Here again the Physical Therapy Section is utilized to contribute skilled instruction in postural drainage, segmental breathing exercises, and pre and postoperative therapeutic exercises to maintain a range of motion and prevent postural deformities, which program becomes an extremely satisfactory experience in the hands of a physical therapist.

Approximately 50 percent of the functions of a Physical Therapy Section in a tuberculosis hospital are devoted to the treatment of nontuberculous conditions. The modalities used are no different from those used in other hospitals which are familiar to the physical therapist and need no description here. The patient whose condition is well arrested or apparently cured is treated as any other person without tuberculosis. However, for the patient who has active tuberculosis, caution is exercised so that any therapy prescribed is not overdone. If the therapy indicated is diathermy, the need for caution is especially great, and the chest and dorsal area must be protected from heat at all times.

Dr. Samuel Phillips of the Kennedy Veterans Administration Hospital, Memphis, Tennessee, has written a very informative paper titled "Physiotherapy for Associated Conditions of Tuberculosis Patients," in which he lists recommended treatment for cases of arthritis, myositis, bursitis, dermatitis, fracture, amputation, paraplegia, hemiplegia, burns, Bell's palsy, and paralysis agitans in patients with tuberculosis. He concludes his article with this statement, "I must repeat that in this, perhaps even more than in other branches of medicine, every patient must be carefully considered on an individual basis, and the advantages of the proposed therapy must outweigh all likely risks." This

statement could well be made relative to any disease, but particularly is it true in a tuberculosis hospital. *Nothing* shall be done to retard the patient's cure of his tuberculosis.

So little has been said or done in this field of physical therapy for the tuberculous patient that it is a wide-open opportunity for clinical study and research. One of the most valuable and enlightening experiences for one who wishes to learn about disease is to work in a tuberculosis hospital. It is only by observing great numbers of cases with variations of involvement and differences in age and personality that one can really learn about the ramifications of this disease and the physical therapy that is an essential, even vital, adjunct in its cure.

A Convenient Adjustable Crutch

An Aid in Crutch Measurement and Practice Walking

Sidney M. Dawe

The usual procedure in selecting a pair of crutches for a patient is to stand him against a wall or in a walker and take a tape measurement from the axilla to the floor. The crutches are then ordered from the hospital brace-shop or supply room. Not infrequently, when they are delivered and tried on the patient, the crutches are found to be too long or too short. Even when they are the correct length, the hand grips often prove not to be in the proper position for effective downward pressure of the patient's arms. Crutch measurement tables based on the patient's height are unreliable, since they cannot account for the differences in relative proportions of individual arm, trunk, and leg lengths.

Because of the aforementioned disadvantages in determining the proper crutch size, the physical therapy staff of the Kern General Hospital sought to avail itself of a really convenient adjustable crutch. We submit the device decided upon as a definite improvement over the conventional adjustable crutch with bolts and wing nuts, which was found to be slow and cumbersome to operate.

Physical therapy staff, Kern General Hospital, Bakersfield, Calif.

Above, Figure 1.

To the right, Figure 2.

The crutch, as pictured here, is of a smooth-working ratchet type. The hand-grip distance as well as the crutch height from the floor is clearly indicated along the vertical wooden supports. *(See Figure 1.)*

To fit a pair of these crutches to a patient, the operator places the toe of his shoe upon the small metal tab near the rubber crutch tip at the floor, and, with the hand on the crutch grip, simply draws upward until the underarm piece reaches the desired level, where it is automatically locked. *(See Figure 2.)* The hand grip contains a pin on a spring which snaps easily into drilled holes. *(See Figure 3.)* Thus the crutch is ready for practice walking, and, if further adjustments are necessary, they can be made immediately. A glance at the two scales gives the patient's hand-grip level and crutch height.

The adjustment mechanism is incorporated into any ordinary crutch and offers a range of forty-three to sixty inches in height for adults; it may also be incorporated into a second pair for children and youths with a range of twenty-nine to forty-one inches. This device has proven stable and secure for the heaviest orthopedic cases.

Figure 3.

UNESCO Book Coupon Plan for Obtaining "Physical Therapy Review"

The PHYSICAL THERAPY REVIEW offices have been informed that foreign orders for subscriptions to the REVIEW, or for single copies, may be placed through the UNESCO Book Coupon Plan. The Plan was established by the United Nations Educational, Scientific, and Cultural Organization to enable individuals and institutions in certain foreign countries to purchase American books and periodicals despite the dollar shortage. (The American Booksellers Association, Inc., has been designated by the United States State Department to handle the Plan in this country.)

UNESCO Book Coupons may be obtained at the Central Distributing Centers in all participating countries. (See list of Distribution Centers.)

Coupons are purchased in the currency of the participating country, thus by-passing the prohibitive dollar exchange. These coupons may be sent directly to the *American Booksellers Association, Inc., 724 Fifth Avenue, New York 19, N. Y.*, by the individual or by his bookstore. (The foreign subscription price per year is $6.75 for the REVIEW, which is published by the American Physical Therapy Association, 1790 Broadway, New York 19, N. Y.)

DISTRIBUTION CENTERS

Czechoslovakia—Orbis Co., Stalinova 46, Prague XII

Egypt—Administration of General Culture, Ministry of Education, Cairo

France—Direction des Bibliotheques de France, 55 rue St. Dominique, Paris 7e

India—Ministry of National Education, Government of India, New Delhi

United Kingdom—UNESCO Book Coupons, c/o Book Tokens, Ltd., 28 Little Russell Street, London, England

Israel—Dr. G. J. Ehrlich, Import Licensing Office, Ministry of Education and Culture, Hakirya

Germany (Bundesrepublick)—Notgeminschaft der deutschen Wissenschaft, Buechelstrasse 55, Bad Godesberg

Iran—The President of the Persian National Commission for UNESCO, Avenue du Musee, Teheran

South Africa—The Department of Education, Arts, and Science, New Standard Bank Buildings, Pretoria

Italy—Italian National Commission for UNESCO, Villa Massimo, Largo di via Villa Massimo, 2, Roma

Burma—The Secretary, Provisional National Commission, Secretariat Buildings, Rangoon

Indonesia—The Ministry of Education and Culture, Djalan Tijlatjap 4, Djakarta

Thailand—Thailand National Commission for UNESCO, c/o Ministry of Education, Bangkok

Hungary—Ibusz Company, Akademia-utca 10, Budapest V

Editorials

An editorial in the January 6, 1951, issue of the *Journal of the American Medical Association* is entitled "Dues in the American Medical Association." The reason for the editorial is to answer the question, "What does a physician gain by being a member of the American Medical Association?" All professions have this same question. Although a comparison cannot be made directly, much of the content can be applied to any profession. In these days of rapidly rising prices, each of us is understandably interested in a financial investment which will bring a fair return. Perhaps we have overlooked the soundness of our annual fifteen dollar investment in the form of American Physical Therapy Association dues.

In the REVIEW, in communications to members and chapters, and at the annual conference, interpretation of our Association's activities, its efforts to develop the profession, and its services to members are constantly being emphasized. To the thoughtful reader and listener there is no doubt of the value of his professional organization. To others it is still—What does it do for *me?* It would take more than a brief column to outline all that the American Physical Therapy Association does. Members sometimes forget that a professional organization has a two-fold responsibility; one, to the physical therapist, but even more important, to the profession of physical therapy. The latter may not be immediately apparent for we are dealing with intangibles. It's not something that can be seen like the magazine or a larger figure on a salary check. It should be said, however, that salary ranges now, as compared with those a few years ago, are directly linked to the development of the profession.

There are in addition other very tangible services to members offered in the National Office and through the field staff. The placement service is active and available to all members. Professional guidance and consultation is provided both by personal interviews and extensively through correspondence. Advisory and consultation service is constantly requested and given to employing agencies with resultant benefits to members.

We are asked about qualified physical therapists who are not members of the American Physical Therapy Association. They receive but do not give, either through financial support or through participation in chapter and national activities. Your membership dues pay for services to them also. In developing the profession and in interpreting it to employing agencies, physicians, and other allied professional workers, the Association is working for all qualified therapists.

The Association is extremely fortunate in having so many loyal and active members who not only pay their dues promptly but who accept work responsibilities in their chapters. They comprise the Association and stimulate it to even greater accomplishments. We naturally would like to see every eligible physical therapist a member of our Association. We think it's not only a privilege but a duty to give support to a chosen profession.

The American Physical Therapy Association enjoys a well-deserved national prestige which directly reflects upon each member in his local capacity. Such prestige is the result of good organization and brings a sense of security in the knowledge that individual efforts combine to maintain a sound progressive professional organization.

We wish to congratulate the *Journal of the American Medical Association* on its new "face" and format. We like the new cover with its clean-cut type and easily-read table of contents. The new *Journal* is greatly improved in readability and appearance throughout. The amount of time and planning put into these changes is appreciated by us, since problems of layout are common to all. We feel sure that the readers of the *J.A.M.A.* will be grateful to the editors and others who spent so much time and thought in developing the new format.

Association Activities

The Director Reports:

Your National Office is a busy place these days. Travel plans for Colorado are being worked out and material on this will be sent to you in February. Arrangements for the international meetings are going ahead. Be sure to let us know if any of you are planning to be in Copenhagen. A meeting of the Exhibits Committee for the International Polio Meeting was held, consisting of Dr. Rusk, Dr. VanRiper, Dr. Shands, Dr. Weaver, Catherine Worthingham and myself. Our plan is to have a demonstration of polio care much as it was done at the Waldorf Astoria two years ago.

At a meeting of the Board of Directors of the National Health Council, responsibilities for Civil Defense activities were discussed. It is hoped that the activities of national health agencies can be coordinated at all levels. The American Red Cross asked the active support of the Council through its member agencies for their preparedness program. Read the article in this issue on "The Role of the American Red Cross in Civil Defense."

It is also suggested that our chapters procure the new publication, "Health Services and Special Weapons Defense," from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C.; price 60 cents. This has very detailed plans and should be in every chapter file. It is pointed out how important it is to have good reserves, and those areas of the country not designated as "target" will play a very important role in medical care.

In an article in the "Woman's Home Companion" by George Fielding Eliot on the drafting of women, medical specialists—such as dietitians, physical therapists, and occupational therapists—as well as nurses, were mentioned particularly. We have, however, no information on "drafting" of women. We do know that the need for the armed forces will increase. In fact we were told at the consultants' meeting that more than double the present number will be needed. However, as in all the medical fields, the essential needs of the civilian population must receive consideration and some plan for judging that must be evolved. Teaching staffs in the approved schools must be maintained. Others in key supervisory positions and the only physical therapist in a community must also be considered as being essential. Plans for quicker transfer of patients from the military hospitals to the Veterans Administration are also being worked out. This would apply particularly to paraplegics, amputees, chest injuries, polios, etc.

Reported again in this issue are the requirements for a reserve commission and the requirements for entrance in the physical therapy school conducted at the Medical Field Service School. There will be expansion of this school if there are sufficient qualified applicants. Applications for the September class are now being processed.

We are going to prepare a small questionnaire to go out with your dues notice to get some estimate of the number of man hours lost by physical therapists in performing nonprofessional duties. Please be thinking about it, for this information is important to all of us. For example, how many more patients could you serve if you did not have to change linen, scrub out whirlpools, move equipment, take patients back to the ward, make appointments, etc.? We recognize this will not be an all-inclusive survey, but we think you can give us a lot of good help quickly.

Incidentally, the American Nurses' Association is initiating the "A. N. A. Program of Studies of Nursing Functions." It is estimated that it will take five years of investigation, analysis, and study. The cost will be met by the voluntary contributions of State Nurses Associations, amounting to an estimated one dollar per member for five years. This makes it approximately a million-dollar study. Dr. Hugh B. Hullerman, a member of our Advisory Committee, is a member of this Nursing Research Advisory Committee.

We went to the dedication of the new Institute of Physical Medicine and Rehabilitation on January 24th. It is a block-long building, modern in style, lots of windows, attractively decorated. About twice the number of patients can be accommodated as in the old building. Dr. Covalt, the administrator, and a member of our Advisory Committee, says his troubles are only beginning as the waiting list for beds is more than capacity already. The physical therapy department is large and very complete. Barbara White says she needs roller skates to get around.

For Career Days this spring, we have ordered another 20,000 of the brochure, "Is This the Door

to your Future?" Funds for this were made available to us by the National Foundation for Infantile Paralysis. We hope all of you are supporting the March of Dimes. The need mounts with the large number of polio victims the past three years.

The REVIEW Board met in the National Office on January 25th. Present were Jane Carlin, Mary Callahan, and Daniel Bartholomew. Although we know our magazine is a good one, the Board is making every effort to make it better. There is always need for contributions from members as well as any suggestions as to articles. Let the Board hear from you.

MILDRED ELSON, *Executive Director*

Chapter News

The *New York* Chapter is presenting an Educational Institute for members on five consecutive Tuesday evenings starting February 13th. Topics were selected at the suggestion of chapter members and are to be presented by specialists in orthopedics, physical medicine, neurosurgery, and internal medicine. Each topic is to be developed with particular reference to questions which have been submitted to the Educational Committee. The schedule includes the following subjects: scoliosis, low back syndrome, arthritis, the shoulder, the knee.

World Confederation for Physical Therapy

There have been questions regarding the organization of the World Confederation. The following material is abstracted from the proposed statutes which will be presented to the delegates for ratification at the organizational meeting.

Preamble

The physical therapists representing the various nations of the world, believing that the understanding and utilization of the functions of physical therapy will be advanced through unity of thought and purpose, do hereby unite in a confederation of national associations. Such national associations shall work together to improve the physical therapeutic treatment of the ill and handicapped of the nations and to advance the professional and economic welfare of physical therapists.

The Confederation shall not be conducted or operated for profit and no part of the net earnings of the Confederation shall inure to the benefit of any member or any individual; nor shall any of such net earnings or the property or assets of the Confederation be used otherwise than for any or all of the purposes of the Confederation.

The objects of the Confederation are:

(1) To encourage improved standards of physical therapy training and practice in order to provide the highest quality of service to the patient;

(2) To promote in all the nations scientific research and opportunities for obtaining knowledge of new developments in the field of physical therapy;

(3) To encourage and promote appropriate means of communication and exchange of information between the nations with respect to the advancement of physical therapy;

(4) To provide information, counsel and assistance in the field of physical therapy;

(5) To assist in developing an informed public opinion among all peoples in matters relating to physical therapy;

(6) To organize at regular intervals international congresses of physical therapists to foster the development of physical therapy and to make available reports thereof;

(7) To cooperate with the appropriate agencies of the United Nations and other appropriate national or international organizations.

Member Organizations

One national association from each country composed of physical therapists or a national federation of physical therapists may become a member organization of the Confederation provided that its constitution and/or bylaws or Articles of Association are in harmony with those of the World Confederation for Physical Therapy.

Meetings

A general meeting is to be called at least once in every five years, the location, time and place to be determined by the Executive Committee.

Delegates

Each member organization shall be entitled to be represented at general meetings and special meetings by one delegate (with two alternates, but with each delegation carrying only one vote). Each delegate or alternate shall bear a written mandate from his organization authorizing him to speak on its behalf. There is a provision for a proxy vote.

Observers

Each member organization shall have the right to send observers to the meetings of the Confederation. Observers may address the meeting at the invitation of the presiding officer but shall be without privilege of voting.

Languages

The working languages shall be English and French. Arrangements are to be made for interpretation from one language to another.

Officers

Elected: President; First, Second, and Third Vice-presidents

Appointed by the Executive Committee: An Honorable Treasurer and Honorable Secretary

In addition, four delegates, who shall be members of the Executive Committee together with the elected officers, shall be elected at the general meeting. These delegates to serve as representatives of their parent organization.

Provision is made for carrying on business by correspondence.

Founder member organizations will be those which convened in London in 1948. The Provisional Committee to carry out the organization was elected by this group, which represented: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Great Britain, Holland, Norway, South Africa, Sweden, and the United States of America. The Federation Internationale des Masseurs Kinesitherapeutes Practicums en Physiotherapie, composed of associations in Belgium, Switzerland, Luxembourg, France, and Holland was also represented.

Provisional Committee

Chairman—Mildred Elson, American Physical Therapy Association

W. M. McAllister, Chartered Society of Physiotherapy, Great Britain

J. A. De Haas, Nederlandsch Genootschap voor Heilgymnastiek, Massage en Physiotechniek, Holland

Andre Nicolle, Federation des Kinesitherapeutes, France

Sigrid Coleridge, Kvinnliga Legitimerade Sjukgymnasters Riksforbund, Sweden

Honorable Secretary, M. J. Neilson, Chartered Society of Physiotherapy, Great Britain

It is the hope of the Provisional Committee that as many physical therapists as possible will attend the organizational meeting. This is an opportunity to form friendships with colleagues from all over the world.

Dates: September 7 and 8, 1951

Place: Copenhagen

Registration and Housing blanks will be available in the National Office for United States physical therapists. These are being prepared by the Honorable Secretary, M. J. Neilson, of the Chartered Society of Physiotherapy. The Chartered Society has generously supplied secretarial and other important services since as yet there are no funds.

Travel

Thomas Cook and Son, Wagon-Lits-Cook, and the American Express Company will aid with reservations for transportation and currency arrangements. Physical therapists from the North American continent who are planning to embark from the port of New York will be interested to know that the Swedish-American lines have made available the MS Stockholm, leaving August 25th, 10:30 a.m. EST. This ship will sail directly to Copenhagen, Denmark, arriving Sunday afternoon, September 2nd, in time for the Second International Polio Conference.

Any member planning to attend should notify the Executive Director. A transportation application is available to send to Thomas Cook and Son, 587 Fifth Avenue, New York 17, N. Y., Attention Mr. Hill; or your local travel agent may request space on the Stockholm. Be sure to mention *both* the International Polio and the World Confederation meetings. Plan also to attend the Fifth World Congress of the International Society for the Welfare of Cripples in Stockholm, September 10 to 14.

Make your reservations early!

Correction

An error was made in the Birtcher Corporation's advertisement in our January and February issues. The photograph sent to the REVIEW for this ad pictured the Bandmaster Diathermy. This illustration should have been of the Birtcher Challenger Diathermy which differs considerably in appearance. We are informed that the correct illustration for this advertisement will appear in a later issue.

Membership News

New Student Members

Cleveland Clinic

Barbara Cope
Barbara Cott
Martha Cutler
Anna Ferris
Robert L. Gossett
Marion F. Kerr
Sally Pancake
Gordon Robertson
Charlotte L. Simon
Stephen Takacs

Columbia University

Joan M. Gettell
Kathleen T. Kennan
Herbert Z. Kravis

Mayo Clinic

Gordon K. Branes

Simmons College

Joan Colligan
Nancy R. Cuetara
Areta Edmonds
Patricia Fallon
Elizabeth Fitzpatrick
Myra Fuhr
Jean Henderson
Marilyn Hunter
Eleanor Kelly
Nancy Lowenstein
Sara F. Mann
Ruth Martin
Jeanne Philp
Janet Singer
Norma Singer
Anne Sommerville

Stanford University

William Bartels
Don A. Krambule
Doris E. Krumlauf
Mike Kumpuris, Jr.
Earl A. Lewis
Helen Mackenzie
Orval McEachen
Cecil L. Ramsel
Jane Rumbolz
Virginia A. Smith
Jack Whitman

University of Colorado

Laura L. Clark
Abraham Friedman
Patricia Patterson

Janet B. Merrill

Janet B. Merrill, charter member, first secretary of the Association, and technical director of the physical therapy school at Simmons College, died on Friday, February 2, 1951.

Miss Merrill's death is not only a great personal loss to many of us, but a professional one as well. It would be difficult to estimate the number of physical therapists who were privileged to have been her students. Her knowledge, insight, patience, and sense of humor inspired everyone to greater endeavor. Her life was devoted to physical therapy and she never ceased to work for its advancement.

A memorial fund in her name is being planned.

Lois A. Stegkemper, Mitchel Air Force Base, New York, has been promoted to the temporary grade of Captain, AFUS.

The following reassignments have been announced: First Lieutenant **Mary M. Will,** Scott Air Force Base, Illinois; First Lieutenant **Lucille B. Burt,** Offutt Air Force Base, Nebraska; and First Lieutenant **Helen L. DeZwarte,** Fairchild Air Force Base, Washington.

Marriages

Kathleen Rector, now Mrs. Kathleen R. Vogt of Youngstown, Ohio.

Marjorie E. Woolley, now Mrs. Marjorie W. Pharr of Jacksonville, Fla.

Helen High, now Mrs. Helen H. Smith of Knoxville, Tenn.

Lilian B. Stockfleth, now Mrs. Lilian S. Mollatt of Moss, Norway.

Frances Stein, now Mrs. Frances S. Kroto of Cleveland, Ohio.

Canadian Physiotherapy Meeting

The Annual Congress of the Canadian Physiotherapy Association will be held in Vancouver, British Columbia, May 25, 1951.

The Canadian Physiotherapy Association has extended a cordial invitation to members of the American Physical Therapy Association to attend this Congress. Delegates should get in touch with Miss Phyllis Lapp, 1615 Trafalgar Street, Vancouver, B. C.

This Congress will be followed by the Third Western International Conference of Physical and Occupational Therapists. The Physiotherapy Association hopes that many of its American friends will be able to attend.

New Brochure Available

The revised edition of "Physical Therapy—A Service and a Career" is now available from the National Office. This new publication, fully illustrated, is entitled "Is This The Door To Your Future?" and contains detailed information concerning training, prerequisite education, and job opportunities. Copies may be secured by writing to the American Physical Therapy Association, 1790 Broadway, New York 19, New York.

General News

New York University-Bellevue Medical Center Opens New Unit

The first new unit of the New York University-Bellevue Medical Center, housing the Institute of Physical Medicine and Rehabilitation, was formally dedicated on January 24th. This new $2,055,000 building provides facilities on First Avenue and Thirty-fourth Street for the Institute, whose program is devoted to the training of disabled persons with the aim of returning them to normal living. The Board of Trustees looks forward to early completion of other Medical Center buildings on this eleven-acre site. The new Institute facilities more than double the capacity for service of the Institute which formerly operated in temporary quarters on East Thirty-eighth Street.

In the presence of Mayor Vincent Impellitteri, Bernard M. Baruch, Winthrop Rockefeller, Dr. Marcus D. Kogel, Dr. Howard A. Rusk, and other civic and medical leaders, Mrs. Bernard F. Gimbel and Margaret Ann Fick, a nine-year-old Institute polio patient, officially opened the building by cutting a broad white ribbon guarding the entrance to the building's main corridor.

Bernard M. Baruch and his daughter, Mrs. H. Robert Samstag, in a special portion of the dedication ceremonies, unveiled a portrait of Mr. Baruch's father, Dr. Simon Baruch, a pioneer in the field of physical medicine. It was the gift of Mr. Baruch, one of the Institute's principal benefactors.

Speaking of the new building, Mr. Rockefeller, chairman of the Medical Center's Board of Trustees, said, "The new Institute could be described accurately as the world's primary center for research and teaching aimed at the rehabilitation of the physically handicapped."

Bay State Society Meeting

The Bay State Society for the Crippled and Handicapped, Inc., sponsored a "Bay State Rehabilitation Conference" in Boston on February 21st. The morning program was devoted to discussion of the state-wide rehabilitation program for Massachusetts in relation to existing facilities and plans for the future. Eugene J. Taylor was the luncheon speaker and in the afternoon a demonstration clinic was conducted by George G. Deaver, M.D.

Cooperative Program to Aid Handicapped Children Announced

The Association for the Aid of Crippled Children and the New York University-Bellevue Medical Center have announced a "joint cooperative venture" for the rehabilitation of physically handicapped children. The Association will underwrite this plan annually, which may total as high as $115,000 during the first year it is in effect, at the Medical Center's Institute of Physical Medicine and Rehabilitation.

A new children's unit will provide facilities for twenty-four inpatients and twenty-five outpatients a day. The Association will provide special equipment and personnel for this integral part of the Institute in addition to the grant already made to aid in the construction of this unit.

Leonard W. Mayo, director of the Association, said, "This participation with the Institute of Physical Medicine and Rehabilitation is the latest step in a pioneering program for handicapped children initiated by the Association more than fifty years ago. We have high hopes that the results of this project will be of increasing value not only to the children it serves, but to the broad development of rehabilitation plans for children and youth throughout the country." Dr. Rusk commented, "Its services will not be limited to any particular type of disability, but will be available for children with orthopedic and neurological problems such as amputations, poliomyelitis, congenital malformations, and some types of cerebral palsy and those with certain medical problems—initially, rheumatic heart disease."

Dr. George G. Deaver, professor of clinical rehabilitation, New York University College of Medicine, will be the physician directly in charge of the new Children's Unit.

The program will be designed specifically for children who have emotional problems in addition to their physical disabilities. It will be coordinated with home nursing and therapy service with particular emphasis on parent training and consultation. The children will have their own gymnasium, their own occupational therapy room, and their own dining room.

The Institute has already received applications for admission to its Children's Unit from all parts of the United States and several foreign countries.

During the past three years, the Institute has had graduate students from all parts of the United States and from thirteen foreign countries. The facilities of the new unit will also be utilized for undergraduate and postgraduate training of physicians, physical therapists, occupational therapists, and vocational counselors.

Specialist Shortage Subject of Army WMSC Conference

A conference of leaders in the fields of dietetics, physical therapy, and occupational therapy was held in the Office of The Surgeon General of the Army on January 6th to discuss ways and means of expanding the Women's Medical Specialist Corps to meet increasing requirements for specialists in these three fields in the Army Medical Service.

Newly appointed consultants to The Surgeon General who attended were: Mable MacLachlan, past president and present Educational Director, the American Dietetic Association; Mildred Elson, Executive Director of the American Physical Therapy Association; and Mrs. Winifred C. Kahmann, President of the American Occupational Therapy Association.

Representing the Army Surgeon General were: Brigadier General Paul I. Robinson, chief of the Personnel Division; Colonel J. T. McGibony, chief, Hospitalization and Operations Branch, Medical Plans and Operations Division; Colonel J. Q. Simmons, Jr., chief, Officer Procurement Branch, Personnel Division; Colonel Emmett M. Smith, chief, Physical Medicine Consultants Division; Major Stephen J. Beaudry, chief, Service and Planning Branch, Education and Training Division; and other members of the Office of the Surgeon General and Women's Medical Specialist Corps staff. Colonel Emma E. Vogel, chief of the WMSC, presided.

In opening the conference, General George Armstrong, the Deputy Surgeon General of the Army, referred to the increasing importance of the contribution of Women's Medical Specialist Corps officers to the Army hospitalization program.

Immediate subject of the conference was a plan of action to aid the WMSC in procuring 247 dietitians, 179 physical therapists, and 146 occupational therapists by June 30, 1951. Colonel Vogel stressed that these figures represent additions to current strength.

Recognizing that there is a continuing nationwide shortage of specialists in all three fields, the following recommendations were made:

1. That each professional organization will circularize its membership calling attention to the urgent military need;

2. That each will determine the number of married members who would be available for part or full-time service in civilian hospitals, thereby relieving for military service those interested in Army careers.

3. That the Army will cooperate by a direct mail information program to guidance directors in high schools and colleges, to stimulate career interest in these fields.

The Army further proposes to extend its training program in all three medical specialties represented in the WMSC.

Requirements for WMSC Physical Therapists

I. GENERAL REQUIREMENTS

A. *Citizenship*—Applicants must be citizens of the United States.

B. *Marital Status*—Applicants may be married or single. However, only women with no dependents under eighteen years of age are accepted for Extended Active Duty at this time.

C. *Sex*—Only female applicants are eligible for appointment.

D. *Physical Qualifications*—Applicants must meet the physical requirements established for Reserve officers in accordance with Army regulations.

E. *Moral Qualifications*—Applicants must possess high moral character and personal qualifications.

F. *Age*—Applicants for appointment must be at least twenty-one years of age and not have passed the birthday indicated for appropriate grade listed below.

II. EDUCATION, EXPERIENCE AND AGE requirements for appointment in grade of:

A. *Second Lieutenant*

1. Applicants must not have reached their thirtieth birthday.

2. Applicants must have completed not less than three years (ninety semester hours) with major emphasis in physical education or the biological sciences, in a college or university and a training course in physical therapy, both of which are acceptable to the Department of the Army.

B. *First Lieutenant*

1. Applicants must not have reached their thirty-third birthday.

2. Applicants must meet the educational qualifications as specified for appointment as a second lieutenant.

3. Applicants must have had a minimum of three years' experience as a physical therapist in medical institutions acceptable to the Department of the Army.

C. *Captain*

1. Applicants must not have reached their thirty-seventh birthday.

2. Applicants must possess a bachelor's degree with major emphasis in physical education or the biological sciences, from a college or university and have completed a physical therapy training course, both of which are acceptable to the Department of the Army.

3. Applicants must have had not less than six years of experience as a physical therapist in medical institutions acceptable to the Department of the Army, three years of which must have been in a supervisory capacity.

4. If the applicant possesses a bachelor's degree, with a major in physical therapy, from a college or university acceptable to the Department of the Army, the applicant must have completed a minimum of seven years of experience as a physical therapist, three years of which must have been in a supervisory capacity.

D. *Major*

1. Applicants must not have reached their forty-fifth birthday.

2. Applicants must meet the educational requirements for appointment as captain in this specialty, and possess a master's degree in a field allied to this specialty.

3. Applicants must have had not less than twelve years of experience as a physical therapist in medical or training institutions acceptable to the Department of the Army, seven years of which must have been in a supervisory or administrative capacity.

III. METHOD OF APPLICATION

The documents which constitute the application should be completed in detail and forwarded to The Commanding General of the Army Area in which you reside.

Army Physical Therapy Course

The Army Medical Service conducts a twelve-month Physical Therapy Training Course which is available to qualified young women, between the ages of twenty-one and twenty-six years, who are college graduates with major emphasis in the biological sciences or physical education and who have indicated that they wish to pursue a career in the Regular Army. For the first phase of the course the student is assigned to the Medical Field Service School, Brooke Army Medical Center, Fort Sam Houston, Texas. During the last phase she is assigned to a teaching Army hospital, where the emphasis is on supervised clinical practice. Selected applicants for this training are commissioned as second lieutenants in the WMSC Reserve for the purpose of taking this course and receive the pay and allowances of that grade during their training. Upon completion of their training, they are assigned as physical therapists in Army hospitals for a probationary period, prior to consideration by The Surgeon General of their applications for commissions in the Regular Army.

Handicapped Children's Program Extended

At a meeting of the Executive Board of the United Nations International Children's Emergency Fund (UNICEF) held on November 27, 1950, the sum of $25,000 was allocated to extend the UNICEF program for handicapped children to Germany. This allocation is in addition to the sum of $160,000 appropriated by UNICEF in June 1950 to aid the handicapped children's program in eight European countries.

Plans have been developed for a course on "The Treatment and Aftercare of Physically Handicapped Children" to be held in the United Kingdom during March and April 1951, sponsored by UNICEF, the World Health Organization, and the United Nations Department of Social Affairs. The outline for the course was prepared by Dr. Harold Balme of the United Kingdom who has been appointed jointly by WHO and the United Nations Department of Social Affairs to act as technical expert to assist Governments in developing UNICEF-assisted programs and to give technical advice. It is expected that about fifty candidates will take this course which will comprise lectures, discussions, and field visits.

In the selection of candidates for the course, the Governments are being requested to send balanced teams of specialists who, when they return

to their countries, will form experienced nuclei to help the Governments develop the work for physically handicapped children. The Governments are also being asked to select candidates who fall within a category where their relationships to the Government in its over-all plan would be of the most value.

The Role of the American National Red Cross in Civil Defense

On April 11, 1950, a statement on "The Role of The American National Red Cross in Civil Defense," was presented to the Red Cross by Dr. John R. Steelman, then Chairman, National Security Resources Board. This was accepted by General Marshall on April 18th. The Red Cross agreed to assist to the extent of its ability in: (a) training civil defense workers and the general public in first aid; (b) training in home care of the sick and injured, and nurse's aide activities; (c) provision of food, clothing, and temporary shelter on a mass care basis during an immediate emergency period; (d) participation in a wartime nation-wide blood program; and (e) making available its existing organized chapter volunteers and resources for participation in civil defense activities. Here is a summary of the action taken to implement these responsibilities.

National Blood Program

On July 20th, the Secretary of Defense requested the Red Cross to serve as the official coordinating agency for procurement of blood and blood derivatives for the armed forces. This responsibility was accepted by General Marshall on July 22nd. On August 30th, Chairman W. Stuart Symington of the NSRB requested the Red Cross "to accept the responsibility of coordinating a nation-wide civil defense blood program for recruitment of donors and collecting, storing, processing, and preparing for shipment of blood and blood derivatives." This was accepted by General Marshall on September 7th.

Present Status: In July 1950, the Red Cross entered into an agreement with the American Medical Association, American Association of Blood Banks, and the American Hospital Association for cooperation between Red Cross and non-Red Cross blood banks during peacetime and emergencies. On August 17th, the armed services gave the Red Cross the first quota for Group "O" whole blood for Korea. This and all other quotas assigned to date have been filled. On December 1st, the Defense Department asked the Red Cross to double its blood collection during December to provide increased quantities of blood for processing into plasma, thus taking the first step in building a stockpile of plasma for military needs.

First-aid Service

Training in first aid was reduced to specific terms in a letter from Mr. Symington, of September 6th, requesting the Red Cross to prepare a first-aid manual and be ready to undertake first-aid civil defense training on a scale never before attempted in this country. On September 13th, General Marshall accepted this responsibility.

Present Status: Over 1,500,000 first-aid textbooks have been ordered and are in the process of distribution. A civil defense supplement to the first-aid textbook has been completed, cleared with NSRB, the Federal Civil Defense Administration, and the Atomic Energy Commission, and two million copies are being printed. Chapters have been directed to organize first-aid training classes for civil defense workers and volunteers. The teaching staff of 59 field representatives and 117 metropolitan chapter directors has been augmented by the authorization of 246 instructor-trainers.

Nursing Services

In a second letter of September 6th, Mr. Symington requested the Red Cross to undertake a greatly expanded program of training in home nursing and of nurse's aides. This commitment was accepted by General Marshall on September 13th.

Present Status: All chapters have been urged to train instructors and instructor-trainers to provide for program expansion. The field staff is concentrating its efforts on assisting the chapters in target areas. An order has been placed for 200,000 additional textbooks, with provision for 300,000 more as needed. A supplement to the home nursing textbook on nursing care in civil defense has been prepared and is being printed for early distribution.

Food and Nutrition Service

With regard to the Agreement of April 18th, General Marshall stated in a talk in Cleveland on September 27th, "The Nursing and Safety Services must be built up—so must Nutrition, which is necessary in canteen service and in emergency feeding of victims of disaster."

Present Status: In July 1950, a new manual for Canteen Instructors was released. Supplementary lessons adapted to civil defense needs are now in preparation. In October, a program was initiated to enroll dietitians and nutritionists to assist chap-

ters by serving on committees, teaching canteen courses, and supervising feeding operations.

DISASTER SERVICES

The agreement of Red Cross on April 18th to assist to the extent of its ability in the provision of food, clothing, and temporary shelter on a mass care basis during an immediate emergency period was announced in the Civil Defense Advisory Bulletin issued on May 18th.

Present Status: All Red Cross chapter disaster chairmen have been requested to confer with the chapter chairman and the mayor or director of civil defense and to assist in the above activities to the extent of the chapter's ability.

VOLUNTEER SERVICES

Thousands of trained volunteers are being recruited to fulfill commitments in connection with civil defense and the blood program for civilians.

Present Status: Steps have been taken with chapters to train 100,000 and to reactivate 150,000 volunteer nurse's aides, Chapter Volunteer Services Committees are working with local civil defense officials to provide trained volunteers to assist in their plans for emergency mass feeding, clothing, and shelter.

Rehabilitation Program Approved

The proposal of the Economic and Social Council of the United Nations to establish a coordinated program for the social rehabilitation of the physically handicapped was approved by the United Nations General Assembly at the fifth regular session in December 1950 at Lake Success, New York.

The proposed program, now officially approved by the General Assembly, specifically requests the Secretary General of the United Nations "to plan jointly with the specialized agencies, and in consultation with the interested nongovernmental organizations, a well-coordinated international program for rehabilitation of physically handicapped persons"; and "to include an amount in the budget estimates of the United Nations for 1951 for employing staff to initiate this program."

The Secretary General is also requested to report to the seventh session of the Social Commission, to be held in 1951, the progress made in developing the program. Representatives of interested specialized agencies and the United Nations met in Geneva in December to study implementation of the program.

Amputee Conference

Announcement has been received from the Kessler Institute for Rehabilitation of the Fifth Annual Amputee Conference to be held on April 5, 6, and 7, 1951. The schedule, which runs from 9:00 a.m. to 4:00 p.m., devotes April 5th to consideration of the upper extremity with discussion of the amputee problem, surgery, prostheses, and training technics. The last hour will include a clinic. On April 6th, the conference will consider above-the-knee amputations of the lower extremity, and on the 7th, similar study of below-the-knee amputees.

Lectures and demonstrations are to be given by the staff and visiting specialists. The conference is open to doctors, limb-makers, therapists, and other rehabilitation personnel. The registration fee is $5.00 and all inquiries regarding this conference should be addressed to Mrs. Noel Dousman, Kessler Institute for Rehabilitation, Pleasant Valley Way, West Orange, New Jersey, where the conference will be held. The telephone number is Orange 3-6571.

Rh Factor Discussed in "The Crippled Child"

Three possible ways to prevent newborn children from being afflicted with cerebral palsy resulting from Rh-factor incompatibility are suggested in an article by a noted cerebral palsy authority in the current issue of *The Crippled Child* magazine, a publication of the National Society for Crippled Children and Adults, the Easter Seal Agency.

Dr. Meyer A. Perlstein of Chicago, a counselor for the National Society and chief of the Children's Neurology Clinic at Chicago's Cook County Hospital, believes the most effective way to prevent this crippling condition is through selective marriages of Rh-negative women with Rh-negative men. He points out that cerebral palsied children, resulting from Rh incompatibility of the parents, come only from the marriage of an Rh-negative woman and an Rh-positive man.

Dr. Perlstein's article, "The Rh Factor—What It Means," also outlines two other preventive methods. One is total blood transfusion for the child suffering from the effects of blood incompatibility, and the other, still in an experimental stage and unproven, is use of injections of protective substances to prevent the pregnant woman's blood antibodies from damaging the child.

In his article Dr. Perlstein presents in lay terms

the answers to many of the prevalent doubts and misunderstandings of the public regarding the Rh factor. He discusses the meaning of the terms "Rh negative" and "Rh positive" and explains briefly what happens when incompatibility is present. The author also points out that only one in twenty-five children born to Rh-negative mothers will develop the condition known as erythroblastosis foetalis, and that, of those who do, only one in five will develop cerebral palsy.

It is emphasized that prevention is the most important way to meet the problem of cerebral palsy from this cause. "The most effective method of preventing sequelae is before pregnancy," Dr. Perlstein says. "To this end, if a woman is aware of her blood type and husband's blood type, she may plan accordingly with respect to childbearing."

Research Study of Therapeutic Value of Toys

A research study of toys to determine their therapeutic and play use for crippled children has been initiated by the American Toy Institute in cooperation with the National Society for Crippled Children and Adults, according to announcement by Lawrence J. Linck, executive director of the National Society. The aim of the study is to find toys particularly useful in working with crippled children and to find what specific purpose each toy is to serve.

Hundreds of different toys, furnished through the American Toy Institute by individual manufacturers, are being used in three areas of study selected by the National Society from their affiliated societies. They are: the Lenox Hill Hospital in New York, the pre-school center of Crippled Children and Adults of Rhode Island, and the cerebral palsy center of the Franklin County Society for Crippled Children at Columbus, Ohio. These centers were chosen because the varied types of treatment found there can give different emphases to the study. Medical direction, trained staffs, and sufficient children available for research also made these centers desirable.

The project has begun the grouping of toys in terms of their primary usefulness. For instance, certain toys for hemiplegics who are reluctant to bring the afflicted hand into action would be classified in order of their therapeutic value.

The participating centers will study which toys are useful in such therapy as stimulating a desired bilateral motion, strengthening fingers, or motivating walking or crawling. They hope to find toys that would help parents of crippled children carry out the directions of the therapist at home. Observations from the study are indicating the importance to the child of success or failure in the use of a toy.

The centers working on the project agree there are many toys which they had not known about, but which they are finding useful. Planning the use of toys to meet individual needs has stimulated ingenuity in this preliminary work with cerebral palsied children and this is expected to help later in the study of toys in relation to other handicaps.

Bound Symposium Available

The Symposium on Physiology (Physiology of the Heart and Circulation and Its Clinical Application in Physical Medicine), which was printed in the November and December issues of the REVIEW, will be available in bound, booklet form within the next few weeks. The price will be $1.00 per copy, and copies may be ordered from the American Physical Therapy Association, 1790 Broadway, New York 19, N. Y.

The material for this symposium, which was coordinated by Harry D. Bouman, M.D., Professor of Physical Medicine, University of Wisconsin, contains many observations and results from original work which is not available in any other form. The information was selected and presented with the physical therapist in mind, and has been compiled in order to assist the reader to understand better the physiological principles underlying effective patient treatment. The symposium was originally presented at the 1950 conference of the American Physical Therapy Association.

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Growth and Development of Negro Infants, III: Growth During the First Year of Life as Observed in Private Pediatric Practice. R. Scott, W. Cardozo, A. Smith, and R. Mayo. The Journal of Pediatrics, December 1950.

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Abstracts

Frostbite

Colonel Wayne G. Brandstadt, M.C., U.S. Army. In THE MILITARY SURGEON, 107:5:386, November 1950.

For the purpose of urgent first aid in hypothermia the patient should be placed in warm surroundings, given energetic and prolonged massage, given calcium chloride intravenously, and given hot drinks by mouth. In massaging, excessive traumatization of the skin must be avoided. After wiping the skin with alcohol swabs, the patient should be wrapped in a sterile towel, pulling strongly on the edges so as to bring it tightly into contact with his body. This is followed by energetic massage over the towel with the open palm. This method has great advantage even over massage with the hand in a sterile glove, since it is milder, easier on the skin, develops a great amount of heat and gives the maximum protection against infection. Massage should not be given when several hours have elapsed after the occurrence of frostbite, because by that time inflammatory symptoms will have appeared and the injured tissues are then in need of absolute rest, plus warming.

The Effects of Various Physical Procedures on the Circulation in Human Limbs

Robert W. Wilkins, M.D., Meyer H. Halperin, M.D., and Julius Litter, M.D., Boston. In ANNALS OF INTERNAL MEDICINE, 33:5:1232, November 1950.

During the past ten years a series of physiologic studies has been carried out on the effects of various physical procedures upon the circulation in the limbs, in the hope of obtaining information of practical value in the physical therapy of peripheral vascular diseases. The purpose of the present paper is to review and summarize this work in order that clinical implications may be more easily derived. The physical procedures that have been studied may be grouped under three main headings: (1) heat, (2) posture, and (3) pressure cuffs.

Some of the results described in this paper have a practical bearing on the therapy of peripheral vascular disease. For example, reflex sympathetic vasomotor activity may be as important as local vasodilating factors in determining blood flow in the limbs. Furthermore, release of sympathetic vasoconstriction, as from warming the body, can have little adverse effect, except possibly through some side loss of arterial pressure in the proximal parts of distally affected limbs. Indeed, the patchy areas of gangrene that may appear in ischemic feet after a lumbar sympathectomy may be due, at least in part, to this mechanism. On the other hand local vasodilating methods, which in normal limbs produce marked increases of blood flow, may in diseased limbs not only fail to produce significant hyperemia but cause local tissue damage. Thus, the local application of heat, except of the most moderate and rigidly controlled sort, is a dangerous procedure in ischemic limbs which burn very easily. Likewise, attempts to cause local "reactive hyperemia" in limbs already ischemic appear not only futile but also hazardous, since extreme care is necessary in order to avoid traumatizing already devitalized tissues.

During Buerger's exercises a side loss of arterial pressure in the proximal vasodilated muscles may deprive the more distal and more needy parts of blood flow. Furthermore, muscular activity or tension in a limb greatly increases the utilization of and the need for oxygen. For these reasons it may be desirable in certain patients to use *passive* rather than active intermittent dependency. The definite increases in blood flow and oxygen tension found in the dependent limb would support such therapy. However, there seems to be no sound basis for elevation of the limb above the horizontal; on the contrary, a definite contraindication exists, since this procedure decreases blood flow.

No evidence was obtained in support of the rationale of intermittent venous congestion to relieve ischemia. In fact, all the data were in agreement that this procedure retards the blood flow. Admittedly, however, no observations were made bearing on the subsequent development of collateral circulation, a most important consideration in cases of peripheral vascular disease.

Apparently, local pressure of any degree reduces the blood flow in a part. Therefore, the pressure of dressings, casts, and even of the bedclothes on the limb, or of the limb upon the bed, should be avoided so far as possible. When linear acceleration of venous flow is highly desirable—for example, in order to prevent phlebothrombosis—and when arterial inflow is adequate even with local mild pressurization, the use of elastic stockings or other types of local compression may be clinically useful.

It is hoped that these physiologic observations will be of benefit in the future physical therapy of peripheral ischemic vascular disease. At least they may help to emphasize that every case must be carefully evaluated, physiologic needs clearly defined, and therapeutic methods critically scrutinized before they are applied.

Compression Fractures of the Spinal Column

John C. Ivins, M.D., Rochester, Minn. In MINNESOTA MEDICINE, 33: 2:154, February 1950.

Such fractures are slow in consolidating; the mistake is commonly made of removing the plaster too soon. In any event it seems safe to say that flexion movement must not be allowed earlier than four months after injury. In the case of the comminuted fractures, it may be necessary to continue plaster immobilization for six months or longer.

Throughout this period of immobilization in a plaster jacket, exercises for the spinal and abdominal muscles are practiced regularly. A good system is to teach the patient a regular schedule of doing these exercises so many minutes out of each hour; they cannot be overemphasized. These exercises maintain the tone of the spinal muscles, and if they are properly done the strength of the supporting musculature should be greater at the end of immobilization than it was prior to fracture. Furthermore, such exercises tend to preserve normal flexibility in the spinal column and help in maintaining the patient's confidence in his recovery.

When a sufficient period of immobilization has elapsed, and roentgenograms show satisfactory bony healing, the plaster jacket is discarded. If the exercises have been faithfully done, it should not be necessary, in the average case, to apply a convalescent brace, such as the Taylor brace. However, these fractures commonly occur in people who work hard with their backs, and in such instances an additional period of strengthening exercises may be necessary. For this purpose, regular gymnasium exercises are best; two or three months may be required for this phase of the treatment.

Guest Editorial: Medicine, Mobilization, and Manpower

Howard A. Rusk, M.D., New York City. In VIRGINIA MEDICAL MONTHLY, 77:12:625, December 1950.

As the problems of health resources for both military and civilian needs in the event of national emergency are basic to any mobilization planning, there is a Health Resources Office as one of the nine basic offices of the National Security Resources Board. Dr. Norvin C. Kiefer is the Director. Other similar offices deal with such problems as production, materials, transportation, manpower, energy and utilities, and similar areas.

The responsibilities of the Health Resources Office are:

a. Mobilization, allocation, and utilization of all personnel necessary for wartime health services in public health work, hospitals, clinics, homes, military services, and similar functions; this personnel includes physicians, nurses, sanitary engineers, dentists, veterinarians, pharmacists, technicians, and all other trained health personnel

b. Environmental sanitation services, including water, food, and milk sanitation; insect and rodent control; emergency housing and shelter sanitation; water pollution control; health aspects of sewage, refuse, and waste disposal; sanitation on Common carriers; and similar activities

c. Veterinary medical services, including the care of sick animals, the prevention of disease in our animal population, the prevention of spread of disease from animals to man, and the inspection of meat and other food products

d. Utilization of health facilities, including hospitals, clinics, laboratories, suitable quarters for emergency health activities, and similar institutions and buildings

e. Provision of all health equipment and supplies, medicinals and chemicals, biological preparations, and blood and blood derivatives

f. Recommendations to assure maintenance of essential teaching and research in the health fields, including provision for exemption from military service of certain categories of teachers and students

g. Provision of professional leadership and direction to plans for the health aspects of civil defense

In order to strengthen the work of this Health Resources Office, the Chairman of the National Security Resources Board this August, at the suggestion of the President, formed a Health Resources Advisory Committee. This committee consists of: James C. Sargent, M.D., Professor of Urology, Marquette University, School of Medicine, Milwaukee, Wis.; Harold S. Diehl, M.D., Dean of the Medical Sciences, University of Minnesota, Minneapolis, Minn.; Leo J. Schoeny, D.D.S., Chairman, Council on Dental Health, American Dental Association, 729 Maison Blanche Building, New Orleans, La.; Mrs. Ruth Kuehn, R.N., Dean, School of Nursing, University of Pittsburgh, Pittsburgh, Pa.; William P. Shepard, M.D., Professor of Public Health, Stanford University, San Francisco, Calif.; John B. Postore, M.D., Executive Director, Hospital Council of Greater New York, 220 East 42nd Street, New York City; and *Chairman*, Howard A. Rusk, M.D., Professor and Chairman, Department of Physical Medicine and Rehabilitation, New York University College of Medicine, New York City.

Studies on Entry and Egress of Poliomyelitis Infection: III: Excretion of the Virus During the Presymptomatic Period in Parenterally Inoculated Monkeys

Harold K. Faber, M.D., Rosalie J. Silverberg, Lester A. Luz, M.D., and Luther Dong, San Francisco. In THE JOURNAL OF EXPERIMENTAL MEDICINE, 92:6:571, December 1, 1950.

While the excretion of poliomyelitis virus in the nasopharyngeal secretions and stools of apparently healthy contacts, of "abortive" cases, and during the presymptomatic, acute, and convalescent periods of the overt disease is a well-substantiated phenomenon, no general agreement has yet been reached on its basic mechanisms, and the sources and routes of egress of the excreted virus can still be regarded as controversial.

Excretion of poliomyelitis virus has been demonstrated in monkeys after four different parenteral routes of inoculation. Virus has been found in both the pharyngeal secretions and the stools after infraorbital nerve dip and after inoculation of the Gasserian ganglion; in the pharyngeal secretions after intrathalamic inoculation; and in the stools after inoculation of the celiac ganglion.

Excretion began as early as the second and as late as the seventh day after inoculation, in all instances before the onset of symptoms.

The immediate source of the excreted virus appeared to be infected peripheral ganglia with neural connections to the mucous membranes of the upper and lower portions of the alimentary tract, notably the pharynx.

Primary infection of the body surfaces was excluded in the experiments and therefore could not account for the excretion of virus.

The mode of elimination was probably by centrifugal spread through axons of peripheral nerve fibers and not by way of the blood stream or lymphatics.

Evidence was obtained that when excretion of virus has once occurred, reinvasion from the implicated surface to other, previously uninfected peripheral ganglia ensues, thus providing new sources for excretion and other potential pathways for invasion of the CNS. It is suggested that such reinvasion may occur serially until the immuniological defenses come into play.

Our experiments lend support to the view that during the initial stage of poliomyelitis, and perhaps throughout its course in some cases, e.g., the asymptomatic and the mild cases without central nervous symptoms, infection is confined to the *peripheral* nervous system. Involvement of the CNS when it occurs is a secondary phase of the infective process and is not a necessary prelude to elimination of the virus.

Excretion is explainable on the basis of the established neurocytotropism and axonal conduction of the virus without resort to the hypothesis of extraneural infection.

Poisoning as the Cause of Poliomyelitis

Ralph R. Scobey, M.D., Syracuse, N. Y. In ARCHIVES OF PEDIATRICS, 67:9:400, September 1950.

Poliomyelitis research, for the past forty-two years, has been directed almost exclusively along only one line of investigation—the virus theory—whereas investigation of causes of other diseases, where progress has been significant, has *included* virus theories but also has investigated all other possibilities as well. That there are causes for poliomyelitis other than a virus has been pointed out repeatedly.

Concepts regarding the nature of many diseases are changing and with these changes progress for the betterment of human welfare is inevitable. Poliomyelitis investigations, unfortunately, have not shown the same degree of progress noted in other fields of medicine. Essentially most of the questions regarding the epidemiology of this disease, that were unanswered

half a century ago, still remain unanswered or are explained hypothetically. Dauer (1938), epidemiologist, has said truthfully, and it is applicable today: "It seems rather remarkable in spite of all the time and effort spent in poliomyelitis studies during the past twenty years so little information in the epidemiology of the disease has been produced."

Poisoning as the Cause of Poliomyelitis (Continued)

Ralph R. Scobey, M.D., Syracuse, N. Y. In ARCHIVES OF PEDIATRICS, 67:10:462, October 1950.

Pascalis (1824) speaks about miasm as a cause of intermittent fevers. He says: "That such exposure proves generally unhealthful, it is readily granted, and they cause rheumatism, palsies, cramp, and a variety of other complaints."

Coventry (1824), writing on endemic fever in the Genesee or Lake Country of New York State, says that it begins with the most violent arterial action; yet ends in the most marked nervous debility. He states that Hippocrates, many centuries ago, described the disease under the appelation "causus."

"During the years mentioned (1792-1795)," he says, "I can truly say that few days occurred, from the middle or latter part of July to the setting in of the frost, about the middle of October, that did not afford me the opportunity of visiting a patient with endemic fever. Having for forty years observed the species of fever spoken of, always accompanied by, and never independent of vegetable and animal decomposition, that it was dependent on, or connected with that process. The deleterious effects of vegetable and animal decomposition on the human body are established by innumerable facts with which the records of medicine abound. . . . Quarantines have been faithfully tried but are found waning," he says.

Summary: (1) A number of theories, other than the virus theory, have been proposed to explain the epidemiology of poliomyelitis. The "poison theory," which for centuries from the time of Hippocrates has been emphasized to explain the paralytic diseases of the past and the poliomyelitis of more recent times, has been more or less generally ignored for almost half a century. Proof that poisons can cause poliomyelitis is given in this report.

(2) The so-called virus of poliomyelitis is considered to be an endogenous chemical substance resulting from this poisoning. Human poliomyelitis and the experimental animal disease are regarded as separate disease entities.

(3) It is pointed out that the more or less general acceptance of an exogenous virus as the cause of poliomyelitis has been influenced by exclusive virus research; mandatory public health laws that legally make poliomyelitis a communicable disease; and widespread virus publicity.

Results of Treatment of Subacromial Bursitis in 340 Cases

Guy A. Caldwell, M.D. and Byron M. Unkauf, M.D., New Orleans. In ANNALS OF SURGERY, 132:3:432, September 1950.

Subacromial or subdeltoid bursitis, long recognized as a clinical entity, is manifested by acute, subacute, and chronic symptoms referable to the shoulder and arm and caused by lesions in the muscular tendinous cuff over the head of the humerus and in the subacromial bursa. Patients afflicted with subacromial bursitis tend to recover spontaneously, the time required for recovery varying from a few weeks up to two or three years, depending upon the nature and stage of the lesion. However, in many the symptoms are so severe or so annoying that the majority of patients seek treatment for relief. Among the many therapeutic measures used from time to time are simple and complicated applications of heat, injections of the bursa and adjacent nerves, roentgen therapy, and incisions for relief of tension and removal of calcified deposits from the supraspinatus tendon and subacromial bursa. The fact that such varied forms of treatment have been recommended for the same condition strongly suggests that none is specific.

The records of 485 patients with subacromial bursitis treated in the Ochsner Clinic during the seven-year period ending July 1949 were analyzed in an effort to evaluate the various methods of treatment employed. The treatments most used, regardless of the stage of the disease, were procaine injections and roentgenotherapy, each supplemented by physical therapy; some patients were treated with physical therapy alone. Follow-up reports of the results obtained on 340 patients after an average period of three years were analyzed with reference to stage of the disease at the time treatment was given. Analysis of these results indicates that:

(1) Satisfactory relief of pain and restoration of a useful range of motion may be obtained by conservative measures in 70 to 85 percent of cases.

(2) Roentgen therapy is an effective measure for the relief of pain produced by tension within the supraspinatus tendon in 85 percent of cases.

(3) Physical therapy is a necessary adjunct to all other measures that may be employed. Physical therapy alone is adequate for many subacute or mild chronic cases.

(4) Recurrent attacks are to be anticipated in 22 percent of cases following acute or subacute symptoms and in 33 percent of patients with chronic symptoms.

(5) The presence or absence of calcified deposits seems to have no relation to the various stages nor to the incidence of recurrent attacks.

(6) The longer the symptoms have persisted the poorer the outlook for relief by conservative measures. In the chronic group of cases 33 percent had poor results.

Diagnosis and Non-operative Treatment of Low Back Pain

John S. Donaldson, M.D., Pittsburgh. In THE PENNSYLVANIA MEDICAL JOURNAL, 53:11:1185, November 1950.

Pain in the lower part of the back can be divided into three main categories—acute, subacute, and chronic.

When origins other than the musculoskeletal systems have been eliminated and the patient complains of mild low back pain without existing deformity, conservative ambulatory measures may be adequate to bring about relief. In cases of mild muscular strain, heat and massage and regulated exercises of involved muscle groups for correction of the strain may be adequate. Such patients should be instructed in methods of eliminating strain by postural correction and education in body mechanics. Strain from a constantly poor posture during working hours should be considered. Too often a soft mattress allowing flattening of the normal lumbar curve will be responsible for back pain, but correction can be obtained by placing boards between the mattress and the spring or changing the patient to a hard bed.

In cases of severe strain or sprain, it might be necessary to put the muscle group at rest for a period of healing, and this can be done temporarily

by adhesive strapping or by fitting the patient with an adequate support. This should be accompanied by physical therapy, and when the symptoms have subsided, exercises as previously mentioned should be instituted. Such cases frequently respond to a properly fitted support together with physical therapy measures. Occasionally, a plaster body jacket is required to give adequate support to a stubborn case which has improved but is not entirely well. It may be necessary to continue with this body jacket for some time or until all symptoms have subsided. The cast may then be bivalved and the patient started on active exercises.

All cases, no matter what form of immobilization is used, should be started on hyperextension exercises as soon as they are free of symptoms and all spasm has subsided. Other exercises are given to develop the gluteals as well as other supportive muscles of the lower part of the back. All back cases, of course, are daily given heat and massage but no active exercises until the acute symptoms have subsided. The remainder of the cases which are not helped by any of the above-mentioned procedures may be relieved by a manipulation. This is found to be true particularly in those cases which, after four or five days of complete bed rest plus leg traction for referred pain, are not helped or even made worse. The usual technic of back manipulation is employed under anesthesia and a certain percentage of these patients are immediately relieved. In the disk cases it is possible that the ruptured nucleus is manipulated back into its lodging. We do not consider that manipulation is advisable in any case considered to be on an inflammatory basis or an actively infectious basis. Such a procedure, though it may give temporary relief, adds further irritation in the long run to the existing condition.

It is only by careful analysis of each case and perhaps a period of study and observation that one can determine how drastic the conservative treatment must be and whether the case is one that will respond to rest of the involved muscles and joints or whether active exercises with or without support will be indicated. Frequently, only a period of study, which might perhaps include a spinal myelogram, will determine whether any form of conservative therapy is advisable.

Book Reviews

Introduction to Neuropathology. *By Samuel P. Hicks, M.D., and Shields Warren, M.D., both of the Departments of Pathology of the New England Deaconess Hospital and Harvard Medical School. Pp. 494, 289 illus. Price $10.00. McGraw-Hill Book Company, Inc., New York, 1950.*

Two well-grounded pathologists have collaborated in producing a new and unusual textbook of neuropathology. It was written primarily for medical students and specialty trainees. This goal was kept in mind well. The result is eloquent testimony that the authors understood the difficult problem of making the subject alive and interesting for a group of novitiates, who usually are discouraged easily by the complexities of neuropathology.

Unlike the average book in this class, there is no arbitrary description of disease entities, but it is evident everywhere that an attempt has been made to base the pathologic picture on sound physiologic and biochemical grounds. It is by this "dynamic approach" that the authors have produced something worthwhile. For example, the second chapter deals with circulatory disturbances and cerebral vascular accidents. The chapter has fifty pages, but the first thirty discuss embryology, anatomy, pathologic physiology, and the mechanisms of vascular accidents. The remainder of this chapter is a direct sample description of the established diseases.

Chapter three, dealing with the disturbances of cerebrospinal fluid and intracranial pressure relationship, is something unusual in a book on pathology. It concludes with an excellent description of hemorrhages in the brain stem from increased intracranial pressure.

One can elaborate further on other chapters, such as the discussions on brain metabolism, and the physiology of head injuries. The actual description of the microscopic pathology has been maintained purposely on a simple level but one wonders whether in places this has not been overdone. For example, the description of posterolateral sclerosis is essentially as follows: "There is evidence of mild or severe degeneration of the white matter of the spinal cord. The posterior and lateral columns show destruction of fibers with phagocytosis. Gliosis is said not to be prominent except when the patient has been treated with liver extract." This description seems inadequate even for beginners. There are numerous other instances of this kind. Perhaps future editors will amplify this somewhat without losing the original intent of the book.

This weakness in the book is overcome by one of the best jobs of illustrating this reviewer has seen in a long time. Furthermore the language, presentation, and bibliography are so well done that the work *in toto* deserves the highest of praise. It can't be considered a reference work in neuropathology but it is certainly a most valuable book for students early in their careers.

Reviewed by IRVING C. SHERMAN, M.D., *Assistant Professor, Department of Nervous and Mental Diseases, Northwestern University Medical School.*

Dictionary of Social Welfare. *By Erle F. Young, Ph.D., The University of Southern California, General Editor. Contributing and Special Editors: George B. Mangold, Ph.D.; Bessie Averne McClenahan, Ph.D.; Clarence S. Williams, and Pauline V. Young, Ph.D. $5.00. 218 pp. Social Sciences Publishers, Inc., New York, 1948.*

Here is a companion and supplemental volume to the same type of work published twelve years ago. Numerous additions and changes were made in the original work to take care of the great expansion in the field of public welfare and to accommodate some of the more colorful words and phrases added to the social vocabulary since the close of World War II.

Social workers and those employed in the field of social welfare will find this a handy reference book. The definitions are couched in ordinary language which can be understood by any person desiring information in the field. They are succinct, clear, and up-to-date.

Just as social work cuts across all social life—biological, psychological—so does the dictionary. All fields of endeavor have been called upon. The work is scholarly, reflecting actual word usage, including racial epithets through which one group expresses its attitudes toward another.

Newcomers to the field of social

work, professionals seeking quick information, and laymen will find this a useful handbook.

Reviewed by ANTOINETTE RAJEK, *Medical Social Worker, Passavant Memorial Hospital, Chicago.*

The Neuroanatomic Basis of Surgery of the Autonomic Nervous System. *By Albert Kuntz, Ph.D., M.D. Price $2.25. C. C Thomas, Springfield, 1949.*

This monograph is an excellent review of the anatomy of the autonomic nervous system. The application of the current understanding of the functions of this system are well covered in the section dealing with the surgical procedures. The author has covered a great deal of territory in a clear and concise fashion. This booklet should be very useful in the library of every physician.

Reviewed by IRVING C. SHERMAN, M.D., *Associate in Nervous and Mental Diseases, Northwestern University Medical School.*

The Physiology of Work and Play. *A textbook in muscular activities. By Sara R. Riedman, Department of Health and Physical Education, Brooklyn College. Cloth. Price $4.90. Pp. 584 with 158 illustrations. The Dryden Press, New York City, 1950.*

This book is one in a series of Dryden Press publications in the biological sciences under the general editorship of Professor L. V. Heilbrunn of the University of Pennsylvania, and contains in its 584 pages a wealth of information.

To bring together in one book the basic physiology of muscle and the practical application of that muscle physiology in the physiology of locomotion is not an easy task. In too many instances, a book like this either becomes a textbook of neuromuscular physiology or a textbook of the physiology of motion with an inadequate treatment of the basic muscle physiology. This author has done a most remarkable job in bringing the two fields together. The references chosen are very pertinent ones, and it is quite clear that the author has fully digested materials from widely different sources before she wrote this book. There is a very good chapter on coordination of motion, and an entire part of the book which deals with organic adjustments to the needs of exercise, such as circulation, heart, and respiration.

This book does not deal with clinical problems, and is not, therefore, a textbook for a course in therapeutic exercises. However, it is the opinion of this reviewer that physical therapy schools, who are giving the basic courses prerequisite to the actual course in clinical therapeutic exercise, will find in this book a text for which they have been waiting a long time.

In any work of this magnitude it is always possible to pick on little instances in which one might not agree with the author in some statement made. However, the over-all quality of this book is so excellent that it belongs in the library of every physical therapist interested in the physiological basis of therapeutic exercise.

It would seem to this reviewer that many physical therapy schools will find this an extremely valuable basic textbook.

Reviewed by HARRY D. BOUMAN, M.D., *Professor of Physical Medicine, University of Wisconsin Medical School.*

The Blinded Bilateral. *By Ralph J. Anslow. Paper, price 75 cents. The Kessler Institute for Rehabilitation, West Orange, N. J., 1950.*

The author of this booklet has described in a very simple manner the tasks of daily living which can be accomplished satisfactorily by the blind bilateral arm amputee. Mr. Anslow, a bilateral arm amputee, was totally blind at the time when he wrote this book.

The purpose of this booklet is to furnish physical therapists, assistants, or companions with valuable information so that they can instruct and assist their patients more effectively.

In Section I, Mr. Anslow describes the clock system of adjusting a hook on the prosthetic arm. At the 6 o'clock position the hook is pointing directly toward the floor, at 12 o'clock toward the ceiling. The hook is horizontal to the floor at 3 o'clock, and at 9 o'clock it is pointing directly away from the body. This system provides a simple method by which both the blind amputee and his physical therapist or assistant may adjust the hook in the proper position for various activities.

Sections II, III, and IV are devoted to eating and drinking, use of the artificial arm in the washroom, and miscellaneous uses of the hook.

All sections include numerous illustrations and precise instructions.

This booklet will be of interest and value to all persons training and assisting the blind bilateral arm amputees.

Reviewed by PAIGE L. WEAVER, *Section on Physical Medicine, Veterans Administration, Washington, D. C.*

The Cerebral Cortex of Man. *By Wilder Penfield, M.D., and Theodore Rasmussen, M.D. Price $6.50, pp. 248. The MacMillan Company, New York, 1950.*

Into a small space the authors have condensed their experiences in cerebral localization derived from cortical stimulation and ablation in over 400 craniotomies done during a period of about twenty years. The analysis of this material is a monumental task done in a careful and scientific manner.

The first part of the study deals with stimulation experiments done in the course of surgical procedures for various conditions. Chapters are devoted to the cortical representation of specific functions, such as sensorimotor representation of the body; head and eye movements; representation of the autonomic system; vocalization and arrest of speech; secondary sensory and motor representation; vision; hearing and equilibrium; memory, sensory perception, and dreams. In each chapter the results of stimulation are detailed in specific examples so that the reader has a clear picture of which point is stimulated and the exact results. The authors do a great service in pointing out the existence of secondary sensory and motor representation adjacent to the classical areas, but their real meaning awaits further study. The same is true for the various areas of sensory elaboration.

There is a short but lucid chapter on the results of excision of cortical regions. Finally, all the material is brought together in discussion form so that the reader is left with a clear impression of what is known. Although this book will have a limited audience it is highly meritorious and should serve as a springboard for years to come for those whose interests lead them further into the unravelling of the complexities of the human cerebral cortex.

Reviewed by GERTRUDE BEARD, *Technical Director, Physical Therapy Department, Northwestern University Medical School.*

SCHOOLS APPROVED FOR TRAINING PHYSICAL THERAPISTS

By Council on Medical Education and Hospitals of the American Medical Association

Name and Location of School	Medical Director	Technical Director	Entrance Requirements	Length in Months	Classes Start	Tuition	Certificate, Degree, Diploma
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[1]Childrens Hospital Society, Los Angeles	Samuel S. Mathews	Sarah S. Rogers	a[6]-b[6]-d	14	Sept	$300	Cert. or Degree
[1]College of Medical Evangelists, Loma Linda, Calif.	F. B. Moor	R. Wm. Berdan	a-b-c-d	12	Sept	$225	Cert. or Degree
[1]Univ. of So. California, Los Angeles	Charles L. Lowman	Charlotte W. Anderson	a-b-d-e-g[6]	14	Sept	$594	Cert. or Degree
[1]Univ. of California Med. School, San Francisco	Lucile M. Eising	Margery Wagner	d-e	12	Sept	$220[2]	Cert. or Degree
[1]Stanford Univ., Stanford (Palo Alto)	Wm. Northway	Lucille Daniels	a-d-e-f-g[6]	12	Jan June Sept	$620	Cert. or Degree
COLORADO							
[1]Univ. of Colorado Med. Center, Denver	Harold Dinken	Mary Lawrence	a-b-d	12	Sept	$300	Cert. or Degree
ILLINOIS							
Northwestern Univ. Med. School, Chicago	Emil D. W. Hauser	Gertrude Beard	a-b-d-e	12	Oct	$450	Cert.
IOWA							
[1]Univ. of Iowa Med. School, Iowa City	W. D. Paul	Olive C. Farr	a[6]-e	12	Sept	$200	Cert.
KANSAS							
[1]Univ. of Kansas, School of Med., Kansas City	Donald L. Rose	Lilyan G. Warner & Ruth Monteith	a-b-d-g[6]	12	Feb Sept	$80[2]	Cert. or Degree
MASSACHUSETTS							
Bouve-Boston School of Phys. Educ., Boston	Howard Moore	Constance K. Greene	g[6]	36	Sept	$550	Degree
Simmons College, Boston	Wm. T. Green / Arthur L. Watkins	Janet B. Merrill	a[6]-b-d-g[6]	16-36	Sept	$650	Cert. or Degree
Boston Univ. College of Phys. Ed. for Women: Sargent College, Cambridge	Kenneth Christophe	Adelaide McGarrett	a-b-d-f-g[6]	12 4 yrs.	Sept	$495	Cert. or Degree
MINNESOTA							
[1]Univ. of Minnesota, Minneapolis	Frederic J. Kottke	Ruby M. Green	d-f-g[6]	2 yrs.	Sept	$126[2]	Degree
[1]Mayo Clinic, Rochester	Earl C. Elkins	Harry Keown	a-b-c-d-e	12	Sept	$250	Cert.
MISSOURI							
[1]Washington Univ. School of Medicine, Barnes Hospital, St. Louis	Sedgwick Mead	Beatrice F. Schulz	f	2 yrs.	Sept	$450[4]	Degree
[1]St. Louis Univ. School of Nursing, St. Louis	A. J. Kotkis	Sr. Mary Imelda	g[6]	36	Jan Sept	$300	Degree
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[1]Columbia Univ., New York	Wm. B. Snow	Floy Pinkerton	a-e-f 1 or 2 yrs.		Sept	$450	Cert. or Degree
[1]New York Univ. School of Education, New York	George G. Deaver	Elizabeth C. Addoms	a[6]-b-d-g[6]	12	Sept	$589	Cert. or Degree
NORTH CAROLINA							
[1]Duke Univ. School of Med., Durham	Lenox Baker	Helen Kaiser	a[6]-b[6]-d	15	Oct	$350	Cert.
OHIO							
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[1]Univ. of Pa. School of Auxiliary Med. Services, Div. of P.T., Philadelphia	George M. Piersol	Dorothy Baethke	g[6] / e	4 yrs. / 12	Sept / Sept	$600[7] / $600[7]	Cert. & Degree / Cert.
TEXAS							
[1]Hermann Hospital, School of Physical Therapy, Houston	Oscar O. Selke, Jr.	Mary Elizabeth Kolb	a-b-d	12	Oct	$300	Cert. or Degree
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WISCONSIN							
[1]Univ. of Wisconsin Med. School, Madison	Harry D. Bouman	Margaret Kohli	a-b-f-g[6]	12	Sept	$120[2]	Cert. or Degree
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(a) Medical Field Service School, Brooke Army Medical Center, San Antonio, Texas, and	James E. Tate, Lt. Col., M.C.	Agnes P. Snyder, Major, WMSC	b-e	12[5]	Aug Mar	None	Cert.
(b) Fitzsimons General Hospital, Denver, Colorado, or	H. B. Luscombe, Colonel, M.C.	Olena M. Cole, Captain, WMSC	Completion of Medical Field Service School				
(c) Walter Reed General Hospital, Army Medical Center, Washington, D. C.	John H. Kultert, Lt. Col., M.C.	Brunetta Kuehlthau, Major, WMSC	Completion of Medical Field Service School				

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For Two-year Course: f=Two years of college with science courses.

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[2]Nonresidents charged additional fee.

[3]Certificate granted by Childrens Hospital Society; degree granted by University of California at Los Angeles.

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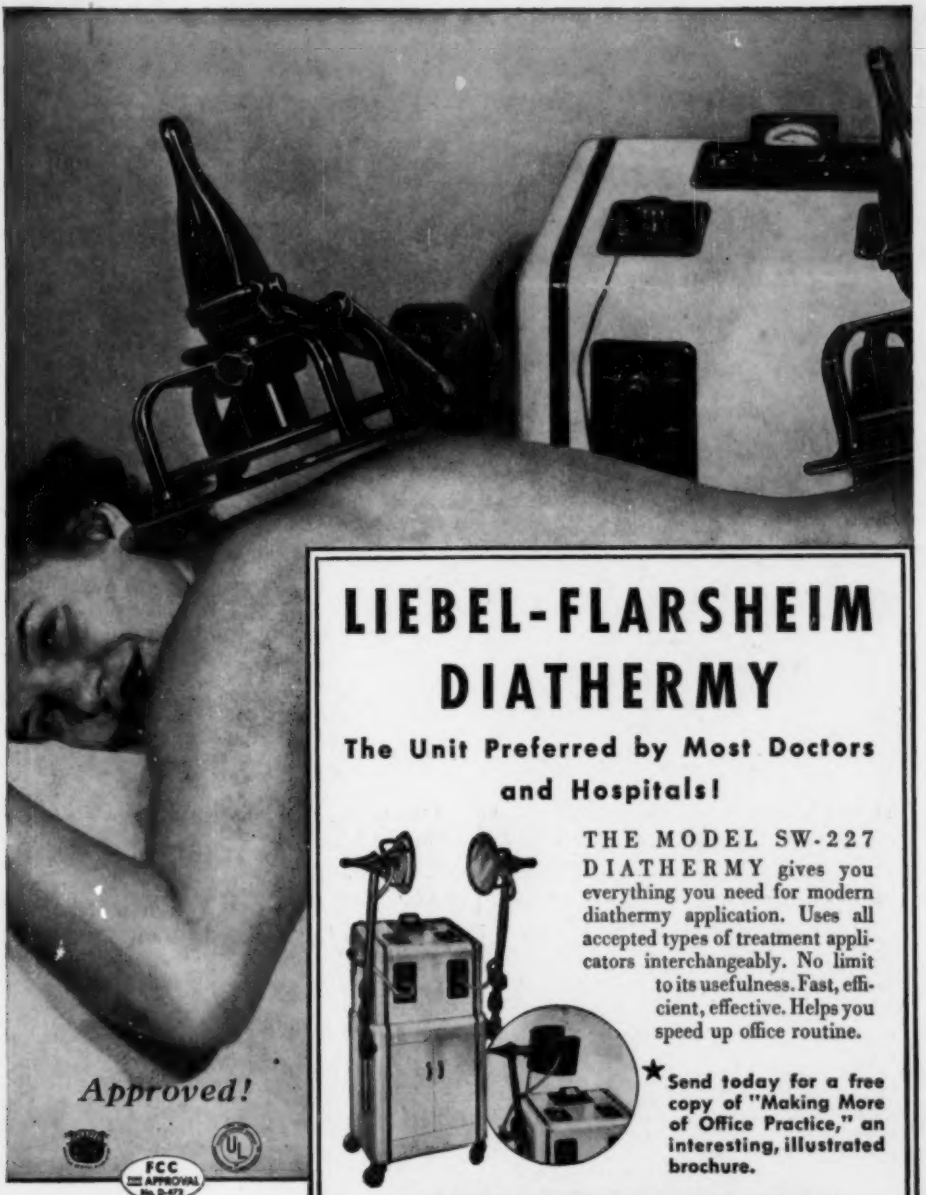

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